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EXAMINING THE CAUSAL RELATIONSHIP BETWEEN OFFICIAL DEVELOPMENT ASSISTANCE, FOREIGN DIRECT INVESTMENT, AND ECONOMIC GROWTH IN SELECTED AFRICAN COUNTRIES

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Abstract

This study focuses on the causal relationship between official development assistance (ODA), foreign direct investment (FDI), and economic growth in selected African countries. Insufficient government funding cannot support all national projects due to limited financial resources. Therefore, the lack of government funding in Africa served as a catalyst for this study. In addition, this study employed the Dumitrescu-Hurlin panel causality test to examine the causal relationship between ODA, FDI, and economic growth for the period 1980 to 2018. Using the Dumitrescu-Hurlin panel causality technique, this study revealed no causal relationship between FDI and economic growth nor between ODA and FDI. Furthermore, the study indicates a bidirectional relationship between ODA and economic growth in Africa. Due to these findings, this paper urges African countries to pay close attention to how ODA is measured as well as the importance of foreign capital inflows (ODA and FDI) in driving economic growth. In turn, this study contributes to the extensive empirical studies of the relationships between ODA, FDI, and economic growth in Africa by shedding light on how policymakers can foster more sustainable growth and stability in Africa.

Keywords: Official Development Assistance, Foreign Direct Investment, Economic Growth, Dumitrescu-Hurlin Panel Causality, Africa

JEL Classification: F14, F4, E4

1. Introduction

Africa faces a formidable challenge of attracting official development assistance (ODA) and foreign direct investment (FDI) due to a lack of advanced technologies and less development in financial markets and systems. Except for Upadhyaya *et al.* (2007), Ndambendia and Njoupouognigni (2010), Ozekhome (2017), and Rao *et al.* (2020), most studies focused on the relationship between ODA and economic growth and FDI and economic growth, rather than simultaneously examining the relationship between the three variables (ODA, FDI, and economic growth). Rao *et al.* (2020) highlight

that there is no empirical literature agreement on the impact of ODA, FDI, and economic development. As a result, empirical studies on the relationship between ODA, FDI, and economic growth are ongoing research.

Furthermore, the causal relationship between ODA, FDI, and economic growth has received little attention. Siraj (2012) recommended that empirical studies examine other foreign capital flows rather than only the ODA. The dispute over the significance of foreign capital inflows, particularly ODA and FDI, extends to the 18th century, with ODA and FDI considered the most powerful engine driving the economy (Rao *et al*. 2020). However, Ozekhome (2017), in the Economic Community of the West African State (ECOWAS), argues that ODA harms economic growth. Therefore, the relationship between ODA, FDI, and economic growth remains an ongoing debate (Rao *et al.* 2020). ODA does not necessarily only attract FDI through the current ODA disbursement direct channel, but also through indirect channels improving the human capital base of the respective provinces (Hien, 2008). Rao *et al.* (2020) state that economic growth in Southeast Asia and South Asia attracts foreign capital only when considering the entire continent, stressing the relevance of economic cooperation in attracting foreign investment. Therefore, the role of ODA and FDI in economic progress is not universal. The study on the relationships between ODA, FDI, and economic growth in African countries is still in its early stages.

This study contributes to the knowledge board in three ways. First, this study simultaneously evaluates three broad variables (ODA, FDI, and economic growth), while most studies focus on ODA or FDI and economic growth. Second, various proxies for ODA, FDI, and economic growth investigated the causal relationship between variables. Furthermore, the causal analysis between ODA, FDI, and economic growth was investigated in the macroeconomic variables space. Finally, the study evaluated the causal relationships between ODA, FDI, and economic growth dimensions. The literature on the broad examination of three variables other than ODA or FDI and economic growth is minimal, particularly in Africa (Adams and Opoku, 2015; Zekarias, 2016).

The remaining sections of the study proceed as follows. The literature review follows in Section 2. Section three presents the statistics and explains the methodology. Next, the empirical results appear and are discussed in Section four. Finally, Section five draws the study to a conclusion.

2. Literature review

2.1. Official Development Assistance (ODA) theoretical foundation

The dual gap theory, proposed by Chenery and Strout in 1966, suggests that expanding disposable domestic savings boosts economic growth in recipient countries. However, it argues that emerging economies often lack sufficient capital formation and foreign reserves for investment opportunities and market development (Appiah-Otoo *et al.* 2022; Azam and Feng, 2022; Celen, 2022). Duresa (2022) identifies two major growth limitations in emerging countries: a savings gap and a foreign exchange gap. Furthermore, Duresa (2022) suggests that ODA can help bridge these gaps, originating from the Harrod-Dormar economic growth paradigm. Finally, Nyoni and Bonga (2017) addressed and identified the significance of ODA in the following four ways that it promotes economic growth: First, ODA supports financial and human capital investment; second, ODA increases the capacity to import capital goods or technology; third, ODA has no indirect effect on savings or investment rates; and lastly, ODA is related to technology transfer, which increases capital productivity and fosters endogenous technological evolution.

2.2. Empirical literature on ODA and economic growth

The contribution of ODA to economic growth has come under intense scrutiny. Chenery and Strout (1966) considered ODA as a component that eases the domestic saving limitation or the foreign exchange restriction, depending on which is applicable. Additionally, Chenery and Strout (1966)

asserted that by enhancing the economy's resource base, ODA boosts investment rate. The effectiveness of ODA in supporting economic growth in underdeveloped countries has long been debated, dating back to the early 1960s, after campaigning for ODA in Eastern and Southern Europe (Hynes and Scott, 2013). The argument that is still ongoing does not come as a surprise. Furthermore, empirical research differs on the impact of ODA on economic growth. However, there are three ways to categorize the studies that empirically examined how ODA affects economic growth. First, studies show support for the theory that ODA has an economic growth impact. These studies include Van Dan and Binh (2019); Nguyen *et al.* (2022); Zardoub and Sboui (2021); Sijabat (2022); Dang *et al.* (2021); Sothan (2018); and Badwan and Atta (2021). The second category of studies includes works by Golder *et al.* (2021); Elakkad and Hussein (2021); Lee, Choi *et al.* (2020); Adebayo and Beton Kalmaz (2020); and Civelli *et al.* (2018), which contain evidence supporting the growth-neutral impact of ODA. Finally, the third category of studies has documented how ODA slows economic growth. These studies include those by Tefera and Odhiambo (2022); Hossain *et al.* (2018) and Yahyaoui and Bouchoucha (2021).

Studies from Africa are specifically highlighted because they show mixed results. Examples of studies that found a link between ODA and economic growth include those by Momita *et al.* (2019); Edo *et al.* (2023) and Tang and Bundhoo (2017). Sabra and Eltalla (2016) used simultaneous equations to analyze the influence of ODA and domestic savings on economic growth in several countries in the Middle East and North Africa (MENA) from 1977 to 2013. Sabra and Eltalla (2016) claim that ODA had a favorable and robust impact on increased imports, higher inflation, lower savings, and more government consumption. However, Sabra and Eltalla's (2016) analysis showed a conflict between ODA and MENA region economic growth. ODA and economic growth suffered due to poor implementation of environmental policies and the Dutch plague (Sabra and Eltalla, 2016). Additionally, Onyibor and Bah (2018) used cointegration analysis to evaluate the association between ODA and economic growth in the five most impoverished African nations from 1986 to 2015. Onyibor and Bah (2018) revealed a long-term positive relationship between ODA and economic growth in Niger and Malawi, but a long-term inverse relationship in Burundi, the Democratic Republic of the Congo, and the Central African Republic. Onyibor and Bah (2018) employed the two-gap theory in their investigation. The two-gap theory proposes that fixed capital ratios and domestic savings are the main forces behind economic expansion (Onyibor and Bah, 2018). According to Onyibor and Bah (2018), ODA closes the investment-to-national-savings mismatch. Furthermore, national savings are domestic and foreign, referencing the two-gap hypothesis, which emphasizes the importance of state savings in fostering economic growth (Onyibor and Bah, 2018).

Furthermore, Rao *et al.* (2020) highlighted that ODA does not promote economic growth or foster favorable national and global settings to attract FDI. Additionally, by lowering domestic saving rates, ODA may hinder economic growth. With cross-sectional data for Southeast Asia (SEA) and South Asia (SA), Rao *et al.* (2020) tested this idea and concluded that domestic savings rates fall due to ODA inflows to SEA and SA. Similarly, Yahyaoui and Bouchoucha (2021) investigated the relationship between ODA and economic growth in Africa, adopting the dynamic ordinary least squares (DOLS) and fully modified ordinary least squares (FMOLS) from 1996 to 2014. Yahyaoui and Bouchoucha (2021) revealed the negative link between ODA and economic growth. Furthermore, Yahyaoui and Bouchoucha (2021) suggested that solid governance increases ODA in Africa but did not offer any proposals for good governance policy.

3.1. Foreign Direct Investment (FDI) theoretical foundation

Uncertainty surrounds the theoretical foundation of FDI. There is currently no agreement on a comprehensive explanation of FDI, despite a wide range of studies explaining this phenomenon (Makoni, 2015). Meanwhile, scholars have widely used production cycle theory, internalization theory, and eclectic paradigm theory to explain FDI phenomena (Knoerich, 2019). This study attempts to

explain FDI by employing international trade theory, eclectic paradigm theory, internalization theory, and neoclassical growth theory. Adam Smith's 1976 view of international trade emphasizes the separation of labor within corporations rather than multinationals. International theory suggests that traditional imports and exports are necessary for moving goods and services across borders due to inflexible production factors and public information about foreign trade opportunities, highlighting a challenging global economy (Kojima, 1973; Morgan and Katsikeas, 1997). The 1970s-era eclectic paradigm theory by Dunning examines ownership, location, and internalization in derivative instruments. Ownership gives investment firms a competitive edge in technology, brand awareness, and human resources, affecting FDI inflows. A good location ensures monopoly benefits and a stable political environment for investing companies. Internalization (I) is a process where a company capitalizes on its initial two tasks to succeed in connections, including multiple elements outside its origin. Internalization helps companies implement trade sales, product sales, and business-to-business interactions, ensuring market share and per capita income for investment enterprises.

On the other hand, internalization theory, developed by Buckley and Casson in 2011, suggests that investment businesses maintain their imperfect market assumption while maximizing investment. The internalization theory suggests that businesses create internal procedures to provide benefits in their goods and that resources are received at an equilibrium opportunity cost, varying based on the goods' nature and acquisition location (Williams, 1997; Casson *et al.* 2009; Denisia, 2010; Buckley and Casson, 2011). Solow's neoclassical growth theory, created in 1956, suggests that FDI is like foreign capital in the conventional model. However, the theory's distribution of FDI flows is uneven, with only a small fraction attracting foreign capital (Zebregs, 1998). Proponents argue that the theory's flaw is its inability to distinguish between direct and portfolio investments, leading to declining investments and rising interest rates (Asheghian, 2010).

3.2. Empirical literature on FDI and economic growth

This section aimed to extensively analyze studies carried out in various economic clusters, using different analytic methods on FDI and economic growth. According to Ciobanu (2021) study, FDI has increased globally over the last decade and leads to a modest increase in economic growth in Romania. FDI is crucial to improve the quality of human capital and boosting economic growth in Romania and especially developing countries (Ciobanu, 2021). In contrast to this paper and using ARDL method, Ciobanu (2021) there is cointegration among the variables when real GDP and foreign direct investment are the dependent variables. Foreign direct investment, trade openness, and labor force are the main determinants of economic growth in the long run in Romania. The Ciobanu (2021) study used the Heckscher-Ohlin theory in the trade theory which indicate FDI is a substitute rather than a compliment of commodity trade while this paper used the neoclassical growth theory. When analyzing the relationship between FDI and economic growth in Turkey, Gokmen (2021) used the Vector Error Correction Model and Granger Causality for the period 1970 to 2019. Gokmen (2021) stressed that FDI is a crucial source of funding, knowledge transfer, and economic growth. In addition, Turkey's Gokmen (2021) found that there is a uni-directional significant short-run positive effect of real GDP on net FDI inflows. Furthermore, according to Gokmen (2021), there is no long-run effect of net FDI inflows found on real GDP, yet vice-versa long-run effect has been found. The findings of Gokmen (2021) are consistent with the exogenous growth theory and the neo classical theory and highlight that FDI could create sustainable economic development, given the conditions of assisting in the formation of human capital, generating technology spillovers, increasing the host country's interaction with the global economy, and thriving the competition among firms in the business environment.

Furthermore, Shkodra *et al.* (2022) investigated the impact of foreign direct investment on economic growth in See Countries, using panel data from 2005 to 2020. According to Shkodra *et al*. (2022), FDI helps the respective countries to increase gross domestic product (GDP) and the general

economic output. However, Shkodra *et al*. (2022) states that other determinants, such as subsidies, capital expenditures, social transfers, goods and services, and wages and salaries are significant predictors of FDI. This, in turn, may stimulate more remarkable economic growth. Shkodra *et al.* (2022) empirical findings validated the endogenous growth theory. The study by Ali and Malik (2018) was based on the eclectic hypothesis, which holds that FDI flows have a good and significant impact and that political stability and infrastructure ensure the monopoly of the investment business. In this instance, Pakistan was a politically stable country that more interested and attracted foreign investors (Ali and Malik, 2018). Ali and Malik (2018) examined the short and long-term effects of FDI on Pakistan's economic growth from 1976 to 2015 using the Augmented Dickey Fuller (ADF) model. According to the study by Ali and Malik (2018), FDI and Pakistan's economic growth are positively correlated in the short term but negatively correlated in the long term. Ali and Malik (2018) pointed out that knowledge, skills, the life cycle of the country's population, sustainable environmental policies, the development of commodities, job opportunities on a national and international level, peace and tranquility, investment policies, and public and private sector projects are just a few of the positive effects of FDI on a country like Pakistan's economy.

In another study that examined the relationship between FDI and economic growth in the 62 middle- and high-income economies, Osei and Kim (2020) used the GMM and Dynamic Panel Threshold Model for the period 1987 to 2016 to investigate the impact of growing financial development on the effect of FDI on economic growth in the USA. According to research by Osei and Kim (2020), raising a nation's level of financial market development significantly impacts economic growth. Benefits of FDI include new technology, expertise, superior managerial and marketing abilities, and horizontal and vertical spillover effects from one company to another through integration and vertical and horizontal expansion. FDI also brings more cash (Osei and Kim, 2020). Furthermore, Osei and Kim (2020) validated that higher FDI led to economic growth and showed that the effect of FDI on economic growth disappears after the ratio of private sector credit to GDP exceeds 95.6%. Osei and Kim (2020) conclude that expanding credit in the private sector often correlates with more robust economic growth.

To evaluate the association between FDI and economic growth in 25 countries of Sub-Saharan Africa (SSA) from 1993 to 2015, Asafo-Agyei and Kodongo (2022) used panel data and the threshold analysis approach. According to Asafo-Agyei and Kodongo (2022) analysis, trade openness, inflation, human development index, government expenditure to GDP, capital to GDP ratio, natural resources, political risk, broad money to GDP, domestic credit to GDP, infrastructure, and corruption and FDI have an appreciable impact on economic growth. Furthermore, Asafo-Agyei and Kodongo (2022) also underlined that FDI threshold level is a necessary, but not sufficient, condition for economic growth. To investigate the link between FDI and economic growth from 1980 to 2013 in 14 East African nations, Zekarias (2016) used panel data and the GMM estimation approach, as Adams and Opoku (2015). According to Zekarias' (2016) findings, FDI and economic growth in East African nations have a robust positive association. The results of Zekarias' (2016) study align with the eclectic paradigm theory, which provides a broad framework for describing the internationalization process and the international trade theory of comparative advantage and differences in factor endowments between countries, given the close relationship between FDI and economics. Furthermore, Zekarias (2016) emphasized how FDI serves as a significant engine for economic expansion and a driving force behind the integration of the region's economy before other factors.

4. Data and methodology

Typically, there are three primary research methodologies: quantitative, qualitative, and mixed-method research. The qualitative research approach is used when the researcher explores a novel area of study and aims to identify and develop theories on significant topics (Jamshed, 2014).

Headley and Clark (2020) stated that qualitative research approaches were established as a systematic research method for studying the social sciences in the late 1800s. These approaches aim to understand the nature of human experience by examining the meanings individuals create to participate in their social lives. Conversely, qualitative researchers aim to comprehend individuals' viewpoints and gain insight into their perspectives to enhance their understanding of how they engage circumstances (Headley and Clark, 2020).

On the other hand, quantitative research differs from qualitative research in that it analyses the relationship between variables to assess empirical hypotheses. Most of these metrics use technologies that enable the analytical examination of numerical quantities (Creswell and Creswell, 2017). Therefore, the current paper used a quantitative research approach to examine the causal relationship between ODA, FDI, and economic growth in specific African countries. According to Amaratunga *et al.* (2002) quantitative data collection methods enable various approaches for data manipulation and verification of data accuracy.

This paper conducted a preliminary data analysis such as descriptive analysis, correlation matrix and unit roots tests to specifically test the validity and reliability data and to identify the countries that received ODA and FDI between 1990 and 2018. Furthermore, the current article purposely selected a sample of 30 countries, including Botswana, Burkina Faso, Central African Republic, Chad, Comoros, Cote d'Ivoire, Democratic Republic of Congo, Eswatini (Swaziland), Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Madagascar, Malawi, Mali, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Togo, Tunisia, Tanzania, and Uganda.

Conversely, from 1990 to 2018, this study used data from the balanced panel yearly. The data cover a short period and include several groups. For a detailed analysis, this study used annual data from 1980 to 2018 to ensure the reliability and consistency of the data. Economic statistics, particularly those obtained from reputable sources such as the World Bank, undergo meticulous validation procedures to ensure precision and comprehensiveness. By limiting the analysis to data until 2018, this study can depend on a thorough and carefully evaluated data set that offers a steady basis for studying the relationship between ODA, FDI, and economic growth in Africa. However, prolonging the data collection time could result in discrepancies or omissions in the data caused by delays in reporting or alterations in data collection methods, which could possibly undermine the precision of the analysis and the reliability of the findings made. Therefore, by focusing on data up to 2018, this study can conduct a more rigorous and reliable analysis of the causal relationship between variables of interest.

The Granger causality test was used in most academic work to experimentally test for causality. This causality test originated with Granger (1969), who is credited as its creator. Dumitrescu and Hurlin (2011) highlighted that the historical value of one variable tends to improve projections of another parameter, making it easy to understand Granger's causation. Consequently, if the past value variable influences the future variable, the past value modifications should come first. Therefore, past events cannot affect future events. It is possible to conclude that the past value is the cause of the future value when future lagged values are considered in a regression analysis of past values in other variables (Alhakimi, 2018). The idea and justification are the same whether past values inspire future values (Gujarati and Porter, 2009).

Granger causality tests have critical problems, including assuming static variables, erroneously assuming that error terms are unrelated, and adjusting cause and effect to chosen lag time. The number of lags used is crucial as the causality path depends on it. Consequently, Liew (2004) suggested using the Akaike information criterion (AIC) or Schwarz information criterion (SIC) to assess lags, like distributed-lag models, to avoid false causation if significant factors are not underpinning. Furthermore, Wang and Hafner (2017) highlighted spurious regression results when there is no relationship in data creation. Dumitrescu and Hurlin (2011) suggested using vector autoregression to address Granger causality problems. Using panel data to establish causal links

between variables can be complicated and overwhelming because the dynamics must first be understood. However, the actual pair of Granger causality tests involving ODA, FDI, and economic growth variables will undergo scientific analysis once we have the results of the unit root test. According to Dumitrescu and Hurlin (2011), there are three types of causality links to look at: (1) Homogeneous non-causality (HNC), homogeneous causality (HC), and heterogeneous non-causality.

The study considers the following specification, observed for T years and N distinct participants, to assess Granger causality between ODA, FDI, and economic growth:

$$\mathbf{y_{it}} = \boldsymbol{\alpha_i} + \sum_{\mathbf{k=1}}^{\mathbf{p}} \boldsymbol{\gamma^k}\, \mathbf{y_{it-k}} + \sum_{\mathbf{k=1}}^{\mathbf{p}} \boldsymbol{\beta_i^k}\, \mathbf{x_{it}} + \boldsymbol{\varepsilon_{it}} \quad (1)$$

where, *x* and *y* are two stationary variables, *i* is the country, *k* is the time lag, parameter ε_{it} are i.i.d (0, $\sigma_\varepsilon{}^2$), *p* is the number of lags and $t \in [I, T]$. The fundamental supposition currently was that the link between *x* and *y* holds for at least one subset of variables in our sample. In line with Dumitrescu and Hurlin (2011), we believe that γ^k are similar for all individuals, and that the regression coefficients β_i^k may include an individual component.

4. Findings and discussion

Table 1 below provides a summary of the four primary unit root tests conducted in Stata, namely LLC, IPS, ADF-Fisher Chi-Square and PP-Fisher Chi-Square, with three different deterministic option terms: no trend, intercept and trend, and individual intercept. All variables in the analysis of this paper are mainly first-order integration for the whole unit root test as shown in Table 1 This means that they are stationary when first differenced. Therefore, this suggests that the variables are cointegrated, as they are not stationary at the same level. In addition, Tables 2 and 3 provide a correlation analysis and descriptive statistics for the variables under investigation. Therefore, Table 2 below indicates that the variables exhibit weak correlations, indicating that the variables have a minimal correlation. This implies that the variables function independently and may not be indicative of each other's behavior, and multicollinearity is not a significant issue. Furthermore, the cross-sectional dependence of the models was assessed using Pesaran's test. The test results were not significant, indicating that the cross sections were independent.

On the contrary, Table 3 presents descriptive statistics, revealing that the mean for the variable GR (economic growth) is 1.55%. This means value is comparatively lower than the average GDP growth rate observed in other similar emerging market economies, as exemplified by Ozekhome (2017). In particular, the lowest recorded growth rate for GR indicates a negative growth of 47.50% meaning African countries cannot attract foreign capital. The results corroborate the predictions of several economic growth theories, which hold that countries with sluggish economic growth rate find it difficult to attract foreign investors. As a result, foreign investors are more willing to invest in countries that exhibit robust economic growth. This highlights the importance of alleviating conditions that lead to a slower economic growth rate to create a more favorable setting for the influx of foreign investors into Africa. On the other hand, the highest GDP growth rate observed amounts to 37.54%, potentially indicating a recovery phase for a country within the sample that experienced a low or negative economic baseline. Furthermore, the standard deviation from the mean in the sample is 4.87, reflecting the degree of variability in the GR values.

Table 1. Panel unit root tests

Variable	No trend	Intercept and Trend	Individual Intercept	Decision
Panel unit root test using the LLC:				
FDI	-3.93273***	-9.77178***	-6.74358***	I (1)
GR	-12.7556***	-16.1517***	-16.2913***	I (1)
ODA	-8.37241***	-6.43103***	-5.42063***	I (1)
Panel unit root tests using IPS:				
FDI	-	-11.1624***	-7.62667***	I (1)
GR	-	-18.0394***	-18.3381***	I (1)
ODA	-	-6.74427***	-4.66801***	I (1)
Panel unit root testing using ADF to Fisher Chi-Square:				
FDI	97.2116***	231.874***	183.356***	I (1)
GR	400.598***	425.461***	410.281***	I (1)
ODA	158.895***	145.904***	122.326***	I (1)
Panel unit root testing using PP - Fisher Chi-Square:				
FDI	148.959***	228.129***	189.271***	I (1)
GR	537.165***	806.760***	525.644***	I (1)
ODA	163.616***	154.204***	116.831***	I (1)

Notes: ***; **; * indicates that the null hypothesis of unit root tests is rejected at 1%, 5% and 10%, respectively. All the tests are at first difference (except indicated otherwise). Probabilities for all the tests assume asymptotic normality except for Fisher tests which are computed using the asymptotic Chi-Square distribution. FDI represents foreign direct investment, GR represents economic growth, and ODA represents official development assistance.

Source: Author's own computations

Table 2. Correlation analysis

Variables	FDI	GR	ODA
FDI	1,000		
GR	0.095***	1,000	
ODA	-0,041	-0,099***	1,000

Notes: ***, **, * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Source: Author's own computations

Table 3. Descriptive analysis

Var.	Obs	Skewness	Kurtosis	Jarque-Bera	Prob.	Median	Mean	Std. Dev.	Range	Min.	Max.
FDI	870	4.71	34.20	38506.22***	0.00	1.85	3.00	5.17	42.05	-8.59	50.64
GR	870	-1.55	26.38	20165.03***	0.00	1.79	1.55	4.87	-9.96	-47.50	37.54
ODA	870	2.79	16.39	7626.21***	0.00	6.89	9.28	10.08	94.76	-0.19	94.95

Notes: Obs= Number of observations; Std. Dev. = Standard deviation. FDI represents foreign direct investment, GR represents economic growth, and ODA represents official development assessment.

Table 3 above revealed that the variable FDI had a mean value of 3.0% of the GDP. Marandu *et al.* (2019) concluded that the reason for the low share of FDI flows to Africa is the approach adopted by African countries in promoting FDI, which focuses more on providing incentives and less on creating a domestic environment conducive to entrepreneurship. Our study's results confirm Marandu *et al.* (2019) claim, as we also recorded a mean of 3.0% for FDI. One of the sampled African countries had the minimum FDI contribution to GDP of -8.59%. This negative value implies a net capital outflow, indicating that FDI outflows exceeded net FDI inflows in Africa. Consistent with the hypotheses of international trade theory, these results demonstrate that net capital outflows are influenced by variables such as investment diversification and domestic economic conditions. Therefore, this impedes policies designed to encourage economic growth, improve the investment environment, and

address structural obstacles to foreign investment. On the contrary, the maximum percentage of FDI observed was 50.64%. This maximum percentage may suggest stability for a country within the sample that experienced a low or negative FDI baseline. Furthermore, the standard deviation of the FDI values from the sample mean is 5.17, indicating the variability of the FDI values around the average.

On the other hand, ODA, as one of the key independent variables, has a mean value of 9.28%. This means that on average 9.28% of the gross national income (GNI) of the African countries sampled during the analysis period came from ODA. The findings presented in this study are consistent with the Dual Gap Theory, which proposes that developing countries encounter two disparities: one between investment and savings and the other between foreign exchange and savings. The dependence of African countries on ODA as a substantial revenue stream signifies a reliance on external resources to close the gap between savings and investment. Evidence indicates that ODA is used to finance domestic investment deficits and support development initiatives, as indicated by the mean value of 9.28% for ODA in gross national income. Therefore, the Dual Gap Theory argues that addressing structural barriers to economic development and reducing the need for external assistance remain enduring challenges, which are highlighted by this reliance on ODA.

However, this average ODA mean for selected African countries is lower compared to a combined index of similar studies on emerging or developing markets, which reported a comparative mean of 19.60% (see, Hongli and Vitenu-Sackey, 2023). The minimum contribution of ODA to the gross national income among the sampled countries is -0.19%, while the maximum is 94.95%. Significant deviations observed in ODA values can be attributed to the challenging economic and socioeconomic conditions experienced by African countries. The lingering negative impact of ODA is due to political instability that led to a slowdown in foreign capital inflow of multinational corporations (MNCs), resulting in a high level of unemployment and poverty (Hongli and Vitenu-Sackey, 2023). Furthermore, beyond the direct effect of foreign capital inflows, corruption also hindered ODA and economic growth, leading to a high poverty rate in Africa (Hongli and Vitenu-Sackey, 2023). The standard deviation for the ODA is 10.08, indicating the degree of variability in the ODA values from the mean.

Furthermore, identifying the causal relationship between ODA, FDI, and economic growth gives policy makers insight into the role and interdependence of these components in Africa. The study used Dumitrescu-Hurlin causality to evaluate the causal relationship between these three variables. However, in the event of cointegration, the Engle and Granger (1987) causality test in the first difference variable employing a VAR (Vector Autoregressive) model will yield misleading results. As a result, adding an Error-Correction Term (ECT) to the VAR model is required. Therefore, the direction of causation is determined by the Dumitrescu-Hurlin panel of long-run cointegration causality tests, as illustrated in Table 4 below.

Table 4. Pairwise dumitrescu hurlin panel causality tests

Variables	***W-Stat***	***Zbar-Stat***	***W-Stat***	**Zbar-Stat**	**Zbar-Stat**	**Zbar-Stat**
	Δlnoda	***Δlnoda***	***Δlnfdi***	***Δlnfdi***	***Δlngr***	***Δlngr***
Δlnoda			2.713	1.155	3.757***	3.506***
			[0.2480]	[0.2480]	[0.0005]	[0.0005]
Δlnfdi	2.374	0.392			2.259	0.132
	[0.695]	[0.695]			[0.8950]	[0.8950]
Δlngr	3.470***	2.860***	2.912	1.604		
	[0.0042]	[0.0042]	[0.1087]	[0.1087]		

Notes: Probability values, which represented the probability values of the F-statistics, and the Wald Chi-Square tests, are in brackets [] and reported next to the corresponding F-statistic and sum of the lagged coefficients, respectively * indicate the significance at 10% significance level, ** indicate the significance at 5% significance level, *** indicate the significance at 1% significance level.

Source: Author's own computations

The findings of the causality test in Table 4 indicate that no unilateral or related causality runs from FDI to economic growth when FDI is the dependent variable. Therefore, these findings refer to the poor financial management of Africa. The predictions of international trade theory, which state that FDI can boost economic growth through knowledge transfer, improved competitiveness, and access to new markets, are in contradiction to these findings. Furthermore, the international trade theory stressed that FDI and economic growth should be closely related, but since this is not always the case, the results could be misleading. There is some evidence that variables, including absorptive ability, institutional quality, and host nation policies, affect the extent to which FDI contributes to economic growth. These findings indicate that FDI could not be the only factor driving African economic progress. To effectively harness FDI's developmental potential, it is crucial for African authorities to remove systemic obstacles such as regulatory hurdles, infrastructure gaps, and institutional inadequacies. The results of this study contrast with those of Abbes *et al.* (2014), Adali and Yuksel (2017), and Sothan (2017) for Cambodia, which documents the existence of a causal relationship between FDI and economic growth.

However, the findings of Table 4 indicate that there is neither a unilateral nor a bilateral causal relationship between FDI and ODA. The results presented in Table 4, which indicate that there is no causal relationship between official development assistance (ODA) and foreign direct investment (FDI), contradict the hypotheses of international trade and two-gap theories. These theories posit that ODA and FDI should have reciprocal effects on economic development. Therefore, the lack of a definitive causal relationship between ODA and FDI implies that these two types of investment can impact economic growth in a way that is different from each other. As indicated, policies that target one may not inherently increase the efficacy of the other in promoting economic growth and development. Consequently, efforts to leverage the correlations between FDI and ODA for sustainable development may be hindered. The result of this paper is in line with those of Wehncke *et al.* (2022), which conclude that there is no causation between ODA and FDI in the short- or long-term. Finally, the study's findings in Table 4 reveal that the relationship between economic growth and ODA is more robust than between FDI and economic growth and between ODA and FDI.

5. Conclusion and recommendations

The study examined the causal relationships between ODA, FDI, and economic growth in Africa. The African literature on the causal effect of ODA, FDI, and economic growth is very scarce. Previous studies examining the causal effects of ODA, FDI and economic growth used mainly the ARDL approach, which was conditional on ODA and economic growth, and FDI and economic growth. There is a dearth of literature that examines the causal relationship between ODA and economic growth and FDI and economic growth, and this study contributes to this literature. Understanding the multidimensionality of ODA and FDI and how they are measured helps to develop the right strategies to attract foreign capital flows. If ODA and FDI are not measured correctly, policymakers adopt wrong strategies to attract foreign capital flows with no effect on encouraging economic growth. Additionally, understanding the efficacy of ODA, FDI and economic growth was helpful, as the results revealed critical links between these variables. Therefore, this study concludes that there is no unilateral or related causation that runs from FDI to economic growth when FDI is the dependent variable. On the other hand, the study finds an inverse relationship between ODA and economic growth in Africa. Furthermore, the study indicates that there is no unilateral or bilateral causal relationship between FDI and ODA. With the current drive of governments to break the curse of ODA in Africa, this study proposes policies that will enhance the efforts of many sitting governments in their quest to boost economic development by channeling increased inward FDI flows and receiving less ODA.

Therefore, this study recommends that the African continent restructures its economies and improves its economic perceptions to attract long-term foreign direct investment. Although the study advocated for an ODA-based funding policy and FDI-based long-term investments, it turns out that

the level of economic growth is crucial to encouraging and maintaining foreign investment. It is also recommended that future studies consider a comparative study employing the same variables but extending the number of countries and economic blocs. For example, researchers could consider comparing MENA and BRICS or the EAC and SADC to determine whether there are differences in the patterns of ODA, FDI inflows and economic growth based on the level of development, the membership of the economic bloc, or any factors that can impact aid dependence or the attraction of FDI. Comparative studies are gaining popularity as they highlight those aspects that defective units can work on improving to elevate their respective statuses.

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