

DRIVERS OF FOREIGN DIRECT INVESTMENT INFLOWS IN SELECTED SUB-SAHARAN AFRICAN COUNTRIES

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ABSTRACT: *Based on the recent slow growth of foreign direct investment (FDI) inflows to Sub-Saharan African countries and the benefits it creates, continuous efforts are being made by scholars on the needs to research the factors that promote FDI inflows, especially in developing countries. Therefore, the aim of this paper is to re-examine the drivers of foreign direct investment inflows in Sub-Saharan African countries from the period of 1999 to 2023. The analysis of determinants of foreign direct investment (FDI) was done based on the neoclassical trade theory and theoretical framework of Dunning OLI eclectic paradigm. The paper was able to show that there is no general theory of FDI in the literature, but several theoretical models are suitable to explain it. Panel data analysis was employed by using econometric techniques of pooled mean group, mean group, fully modified ordinary least squares, dynamic ordinary least squares, and the Dumitrescu-Hurlin panel Granger causality test. Results show that there are long-run relationships among foreign direct investment, trade openness, human capital, financial development, and inflation. The result further indicates that financial development and trade openness are the major drivers of FDI inflows to SSA countries. The causality results show that MKT and FDI, HC and FDI, HC and OPEN, and FD and HC have bidirectional causality. The study recommends policies geared toward trade and investment openness and liberalized financial development in SSA countries.*

KEYWORDS: *Foreign Direct Investment, Pooled mean Group, Sub-Saharan Africa, Mean Group, Fully Modified OLS, Dynamic OLS.*

JEL CLASSIFICATIONS: *F1, F2, F3.*

1. INTRODUCTION

Sub-Saharan Africa (SSA) region is located southward of the Sahara Desert in Africa with a total population of 1.2 billion as at 2024, which comprises of 51 countries in all (World Population Review, 2024). Equally, most of these nations actualized their struggle for independence in the 1960s. Among other international capital flows, foreign

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direct investment (FDI) serves as one of the most important because of its advantages such as; employment creation, skill acquisition, spillover effect, improved capital flow, increase economic growth, export promotion, and so on.

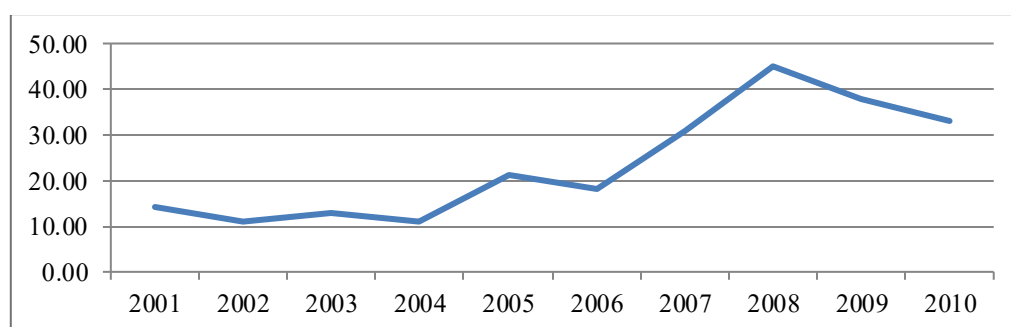
Foreign Direct Investment (FDI) is composed of a flow of foreign capital, transfer of technology, movement of managerial knowledge, equipment and machines into the host nation. In another way, foreign direct investment (FDI) can be described as a process whereby the home country acquires ownership of assets for the purpose of controlling the production, distribution, and other activities of a firm in a host country (Moosa, 2002). Also, World Bank (1996) defines foreign direct investment as the net of investment to acquire a lasting management interest (10 per cent or more of the voting stock) in an enterprise operating in an economy other than that of the investor. The widespread assumption that foreign direct investment through trade openness leads to higher economic growth has occupied a central position in international economic debates. Also, the increased trade liberalization, particularly, among developing countries since the early 1990s and the lack of inconclusive empirical evidence has sparked a discussion among economists, particularly, in Sub-Saharan African (SSA) countries. On one side of the discussion, countries that are more receptive to trade tend to grow economically than those that are none receptive. According to Panagariya (2004), there was no case of a nation that has achieved "sustained rapid development" without having a simultaneous rapid growth in patronage and low barriers to trade. Meanwhile, Rodriguez and Rodrik (2000) argued that, it is the quality of institutions that is most significant, and that openness to trade has no independent force on the development.

In the past, the region forms of scepticism towards FDI have contributed to a shortage of FDI inflows into the region. However, international events have reshaped the attitude of developing countries towards FDI, especially as the debt crises affected most of them in the 1980s. These crises might have a negative influence and reduced access to credit and portfolio investment for most the Africa countries. Due to inadequacies in the capital resources arising from low gross national income (GNI) per capita and low savings, poor domestic investments, and thus low economic growth and development. Alternatively, foreign direct investment inflows could be used as a development strategy to fill this lacuna, hence the needs for huge FDI in the region.

1.1. Overall trends of FDI in sub-Saharan Africa countries

The discourse over the drivers of FDI in Sub-Saharan African nations is quite enormous in the academic cycle. It has been evidenced that the contributions of FDI to GDP during the past 30 years are so modest among the developing countries. Meanwhile, Sub-Saharan African (SSA) has been along the backwardness of the FDI boom. During the period of the mid-1970s, annual FDI inflows to Sub-Saharan African got stagnated for a long time at around \$5 billion. However, the sums received from Latin America as well as Asia, and particularly the East Asia, expanded impressively from the 1980s onwards (Odenthal, 2001). Also, FDI growth in Sub-Saharan Africa (SSA) has not been consistent over the years. For example, in 2008, the region miraculously achieved \$45 Billion FDI inflows despite the worldwide financial and economic crisis. On the

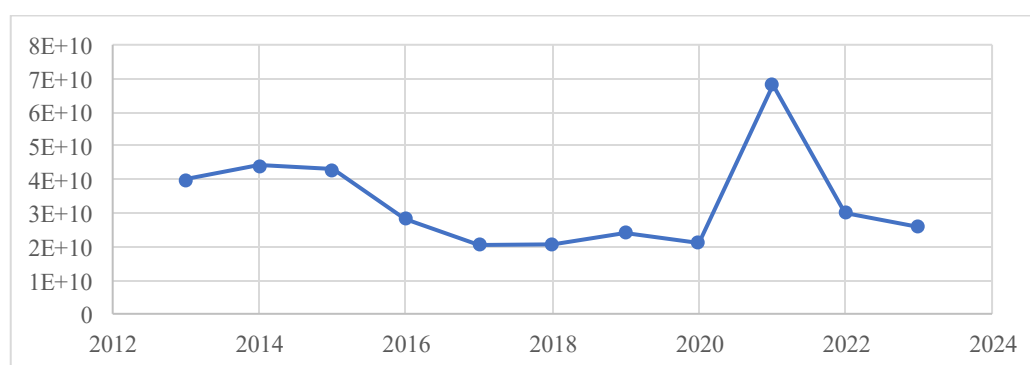
contrary, the region experienced a decrease to the tune of \$38.2 Billion in 2009 and \$32.9 Billion in 2010 respectively (see, Figure 1). The variations in the figures may be due to heterogenous issues such as; high levels of macroeconomic and political instability in the region.



Source: World Bank Development Indicator, 2012

**Figure 1. Foreign Direct Investment in Sub-Saharan Africa, 2001-2010
(US\$ Billion Dollars)**

In recent times, foreign direct investment inflows decreased from 44 billion US dollars to 21 billion US dollars in 2014 to 2020 respectively; this might be as a result of the coronavirus pandemic that negatively affected the world at large but affected the western world more than other continents. The aftermath effect was slightly minimal in the Africa continent. Well, one of the reasons for this little effect might be as a result of weather condition in the tropical region like Africa. As a result of this, investments were diverted to less affected region. In 2021, the foreign direct investment inflows to SSA region increased to around 68 billion US dollars, but dropped to 30 and 25 billion US dollars in 2022 and 2023 respectively. This is worrisome, and call for research on what variable(s) drives FDI into SSA countries.



Source: World Bank Development Indicator, 2024

**Figure 2. Foreign Direct Investment in Sub-Saharan Africa, 2013-2023
(US Billion Dollars)**

Historically, the SSA region has not had an impressive FDI flow due to unfavourable several economic reforms in the time past. In consideration of the benefits that FDI may bring to the region, as predicted by economists such as Asiedu (2002) and Anyanwu (2011). Now, the question that frequently comes to mind is; what are the factors that can attract the inflows of FDI into SSA region?

Based on the recent downward trend in the inflow of FDI into SSA countries, the aim of this paper therefore is to provide empirical investigation into the drivers of foreign direct investment inflows in SSA countries in the recent times. The rest of the paper is divided as follows; section two review the previous literature, section three explains the methodology and data used in the study. Section four analyses the empirical results, and lastly, section five provides the conclusion and policy recommendations.

2. LITERATURE REVIEW

The review of literature in the foreign direct investment determinants is important for the current study because it enables the present study to know what has been done by the previous scholars. Therefore, Foreign Direct Investment (FDI) inflows is the process whereby the home country acquires ownership of assets for the purpose of controlling the production, distribution, and other activities of a firm in the host country (Moosa, 2002). Foreign direct investment is an investment that involves a long-term relationship and reflects a lasting interest and control of a resident entity other than that of the foreign direct investor (UNCTAD, 1999). Foreign direct investment occurs when Multinational Corporations (MNCs) invest directly in facilities to produce and/or market a product in a foreign country (Hill, 2004). In this case, available facilities may attract foreign investors to the host country. Quality institutions and appropriate government policies are important factors that promote foreign direct investment.

According to World Bank (1996), foreign direct investment (FDI) is the net inflow of investment to acquire a lasting management interest (10 per cent or more of the voting stock) in an enterprise operating in an economy other than that of the investor. In addition, FDI is the sum of equity capital, reinvestment of profits and earnings and other long-term capital, and short-term capital. This series shows the net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors. The acquisition of such investments takes the form of merger and acquisition, which is essential to the acquisition of existing interest rather than new investment. Meanwhile, FDI also consists of reinvested earnings, loans, and similar capital transfer linking parent companies and their affiliates. The host country can also acquire foreign direct investment projects within their country and at the same time merge or acquire investments in other countries. This strategy is referred to as inward and outward FDI, while outward FDI includes those investment projects owned in other countries, and this ownership must be at least 10 per cent of the equity shares, otherwise, it is referred to as portfolio investment. The emphasis on trade liberalization and several trade agreements to boost international trade, particularly in the developing countries has caused many countries, particularly low-income ones to centre their interest on FDI as a significant element in their move towards economic development.

Mimiko (2010), refers to this development in the following words; ..."yet another leg in defining the structure of the international economic system has been the whole issue of foreign direct investment (FDI) and their traditional purveyors, the transnational corporations (TNCs)". Institutions and policy makers all over the world have argued in favour of foreign direct investment as an engine for economic growth and development, despite the strong competition that FDI will cause and the possible effect on domestic investment. To this end, Adams (2009) conducted a study to show the relationship between foreign direct investment, domestic investment and economic growth. This result shows that FDI has a positive relationship with domestic investment and economic growth. However, foreign direct investment in terms of technology diffusion, managerial know-how, and the opening up of the economy to international forces with the activities of multinational corporations among other factors, were regarded as benefits of FDI and this cannot be ignored (Feldstein, 2000; Dupasquier and Osakwe, 2006; Alfaro and Charlton, 2007; Mottaleb, 2007; Ayanwale, 2007). The growth effects of FDI in terms of employment creation, technology transfers, management skills and know-how, on the domestic market, employee training, and international connections all abound in the international economics literature (see: Borenzstein et al., 1998; UNCTAD, 1999; Carkovic and Levine, 2002).

To this end, the importance of foreign direct investment cannot be overlooked for both host country and the foreign investor. Even, during the financial crisis, it is more resilient when compared with other sources of capital (see, Hausman and Fernandez-Aries, 2000; Dadush, Dasputa and Ratha, 2000). Foreign direct investment (FDI) takes two forms: the Green-field investment and the Merger and Acquisition (M&A) investment. The Green-field investment involves the establishment of a wholly new operation in the host country, while the second involves acquiring or merging with an existing firm in the host country. Acquisition can be a minority or majority or full/outright stake. When foreign interest assumes 100 per cent, the full /outright takes effect. A minority acquisition occurs when the foreign firm takes a 10 per cent to 49 per cent interest in the firm's voting stock. A majority acquisition, on the other hand, means that the foreign interest assumes from 50 per cent to 99 per cent of the voting stock (Ayanwale, 2007).

According to Ayanwale (2007), an agreed framework definition of FDI exists. Moreover, it is an investment made to acquire a lasting management interest (normally 10% of voting stock) in a business enterprise operating in a country other than that of the investor (World Bank, 1996). When such an ownership interest is less than 10%, it is referred to as portfolio investment. However, FDI comprises not only new investment and Merger and Acquisition (M&A); the profits and loans might be re-invested. According to Ezike (2002) foreign direct investment is the change in the book value of ordinary shares in overseas affiliates and branches. Also, the retained earnings of foreign affiliates are included in these changes; this implies that in the long run multinational corporations (MNCs) will be financing their expansion with both retained earnings and locally sourced capital. From Ezike's definition of FDI above, when there is an increase in the book values of ordinary equity capital because of retention in part of the profit made by the foreign affiliate of the multinational corporation in the host country, FDI is

said to exist. To this end, FDI is not only meant for multinational firms but individuals and governments also engage in FDI.

According to OECD (2009), the benchmark description given to FDI is as follows; FDI is a key element in this rapidly evolving international economic integration, also referred to as globalisation. FDI provides the means for creating direct, stable and long-lasting links between economies. However, in an atmosphere of a right policy, it can serve as an important avenue for local enterprise growth and development as well as also help to improve the competitive position of both the recipient and the investing countries. Oloyede and Obamuyi (2000) define foreign direct investment as an investment in a host country where the foreign investor retains control over the investment, and generally takes the form of branches, affiliates or subsidiary operation. In other words, where the foreign investors exercise control, investments are termed as direct foreign investment and not portfolio investment.

To this end, FDI is now termed to be an investment made by multinational firms in foreign countries in order to control the host countries assets and manage production activities in those countries. From the definitions given above by Oloyede and Obamuyi, multinational corporations are seen as the major legal entity responsible for FDI. In their opinion, control and management of production activities of foreign direct investments are achieved through quality technology, personnel managerial know-how and other types of comparative advantage in the control of their investment in a foreign country. The distinctive feature of multinational firms in respect of FDI corroborates the belief that the theory of FDI is also the theory of multinational corporations. The growth of foreign direct investment (FDI) cannot, therefore, be separated from the problem posed by the existence of MNCs (Ezike, 2002). Similarly, Root (1990) described foreign direct investment as an extension of an enterprise from its home country into a foreign host country and not simply an international transfer of fund. He further explained that the extension of enterprise involves the flow of capital, technology, and entrepreneurial skills to the host economy. These can be combined with raw materials in the production of goods for the local and/or export markets. This transfer of a 'bundle' of factor services remains under the control of the investing (parent) firms, as do the subsequent production and marketing activities of the subsidiary in the host country.

According to Dunning (1993), foreign direct investment is one that involves the transfer of resources (e.g. technology, management skills, organizational capacity and entrepreneurship) across national boundaries. The management or governance of the resources remains in the hands of transferring firms or (in the case of substantial local equity interest), is shared between the subsidiary and the transferring firm. In view of this, Caves (1996) stated that three criteria may be used to classify foreign direct investment. Firstly, a multinational firm shows a long-term, controlling interest over their subsidiaries' production and distribution process. Secondly, there must be movements of productive factors other than capital such as transfers of skilled labour into the host country. Lastly, there must be evidence of the non-rate of return motive to invest, which may include conducting FDI in order to expand products and sales, to seek cheaper raw materials, labour, and market, etc.

In the words of Moss, Ramachandran and Shah (2004), the concerns of the African region are due in part to the fact that policy makers are not well convinced about

the benefits FDI could offer in the region. The challenge facing the African region, therefore, is how to attract more FDI in dynamic products and services with high-income elasticity of demand. In addition, an enabling and conducive environment for investment in a host economy may have a growth effect of FDI. The discussions on economic growth have majority of its basis examined under the relevant sections in this study. However, an explanation of the phenomenon is expedient and is therefore captured in the next section (Ayanwale, 2007).

In the review of the empirical studies, Blonigen and Piger (2014) studied the bilateral foreign direct activity with use of Bayesian statistical techniques. Among the variables included in the study are traditional gravity variables, cultural distance factors, labour endowments and trade agreements. Results show that trade openness, most host-country business costs, host-country infrastructure and host-country institutions have little support to foreign direct investment. Also, Azam and Haseeb (2021) empirically tested whether renewable and non-renewable energy are important as determinants of foreign direct investment in BRICS from 1990 to 2018. The study employed the econometric techniques of dynamic ordinary least squares and fully modified ordinary least squares, cross-sectional autoregressive distributed lag estimators (CS-ARDL), Augmented Mean Group estimator (AMG), and Common Correlated Effects Mean Group Estimator (CCEMG). Findings show that both renewable and non-renewable energy utilization are positive impact FDI while inflation negative affects FDI BRICS countries. More so, the result shows that market size, trade, and tourism are major determinants of FDI, however, economic de-stability retards FDI.

Saleem et. al., (2021) further estimated the major determinants of foreign direct investment flows in Pakistan from 1980 to 2016. The use of ARDL bounds test and error-correction model techniques were employed. The modified WALD test Granger causality test was also used to determine the direction of causality between the variables. Findings show that there is a long-run relationship between GDP, trade openness, foreign direct investment and institutional quality. However, political instability, inflation and real exchange rate retards the FDI growth. Paul and Jadhav (2020) empirically investigated the institutional determinants of foreign direct investment inflows in 24 emerging countries. Findings indicate that infrastructure quality, trade cost, institutional quality are significant determinants of FDI. In the case of the study by Rathnayaka Mudiyansele, Epuran and Tescaşiu (2021), the causal links between trade openness and foreign direct investment in Romania from 1997 to 2019 was examined. Across the world today, foreign direct investments have been considered as one of the most vital sources of external financing for almost all the countries. The study employed the use of Auto Regressive Distributed Lag (ARDL) Bounds test technique. Findings show that in both short-run and long-run relationships, trade openness retards FDI inflows while the Granger causality result showed a one-way directional relationship ran from FDI to trade openness.

Canh et. al., (2020) also examined the determinants of foreign direct investment inflows for twenty-one countries from 2003 to 2013. Using the econometric technique of sequential linear panel data models, findings show that the growth of domestic economic policy uncertainty negatively affects in inflows of foreign direct investment. However, when the domestic economic policy uncertainty interacts with the

World Uncertainty in a study of 143 countries, finding shows a positive impact on FDI inflows. Islam and Beloucif (2024) diverts a bit from the literature by conducting a systematic review of determinants of foreign direct investments into a host country. The study reviewed 112 empirical studies from 2000 to 2018, and found out that the size of the market is the most significant determinant of FDI. While trade openness received the next factor followed by infrastructure quality, labour cost, macroeconomic stability, human capital, and the growth potential of the host country. This study has thrown more light as what is the most important factor in FDI inflows to the host country. In view of this, FDI significantly proves that its market seeking. Recently,

El Fakiri, and Cherkaoui (2024) investigated the nexus between foreign direct investment and financial development in some selected MENA region countries from 2000–2018. Using the ARDL and the dynamic fixed effect (DFE) estimators, the effects of both the short-run and the long-run of financial development on foreign direct investment inflows were analysed. Findings show that in the short-run, there is no significant relationship between FD and FDI inflows while in the long-run, a positive and significant relationship was established.

3. METHODOLOGY AND DATA

3.1. Data, description of variables, and expected signs

The study uses time series data over the period 1999–2023 to empirically analyze the determinants of foreign direct investment inflows in Sub-Saharan Africa countries. To achieve this, a theoretical framework of Dunning (1993; 1998) OLI eclectic paradigm and neoclassical FDI model were adopted. The study specifies the model, economic assumptions underlying the models, estimation methodology, justification of the country's selection and a simple description of the data used in the empirical investigation. Edwards (1992) argued that there exists no universally accepted theory of FDI, therefore, any empirical study on FDI should adopt a pragmatic approach in selecting the explanatory variables to be included in the regressions as adopted in the literature (see Kamay, 2002; Guesmi and Teulon, 2014).

Foreign Direct Investment (FDI): FDI is specified as the inflows of foreign capital into the host country. It is the total of equity capital, reinvested earnings and other long-term and short-term capital as appeared in the capital account of the balance of payments. In this study, FDI variable is used in its logarithmic form. Also, FDI variable represents the dependent variable for this study. As a standard in the literature, the dependent variable FDI is expressed as the ratio of FDI to GDP (net FDI inflows).

Market Size: The per capita GDP of a country can equally determine the size of the host market; it can also represent the host country's economic conditions. In this case, the potential demand for their output is a cogent factor in FDI decision-making. In this study, real GDP per capita is used as a proxy for market size because many practicing economists argue that (GDP per capita) is a better measure of a country's income of the population, compared to the aggregate economic growth. This postulation is in line with previous literature (see Al-Sadiq, 2009; Javorcik et al., 2011). They also agreed that in countries ranked as poor and rich, per capita GDP is used as a measure of country's

income. It is assumed that a country with high GDP per capita will have potentially high demand for domestic output. The parameter β_2 is the coefficient used to determine the impact of market size on FDI. Therefore, a positive and significant relationship is expected.

Openness: The inter-connectivity of the global world in terms of trade has brought about increased access to goods and services and has led to many developing countries economic growth, particularly, Sub-Saharan Africa. Also, trade openness promotes the efficient allocation of resources and greater competition, both in local and international markets. Apart from the fact that openness allows easier diffusion of knowledge and technology across nations, if fewer capital controls and liberal trade policies are applied, it thus attracts more FDI Onyeiwu and Shrestha (2004). The parameter β_3 is the coefficient used to determine the impact of trade openness on FDI. Therefore, a positive and significant relationship is expected.

Human Capital: Considering the innovations in technology, particularly in the 21st century, foreign investors are interested in the quality of the labour force available in the host country in addition to its costs. As labour is categorized as skilled, semi-skilled and unskilled, the investors are concerned about the abundance of an educated labour force that can absorb foreign technologies and in turn increases productivity and, therefore, stimulates FDI. The indication of the high level of human capital in the host country indicates the availability of skilled manpower. In addition, affordable labour cost can significantly promote the location advantage of a host country (Asiedu, 2002; Babatunde, 2011). Following the literature, this study uses secondary school enrollment rate to proxy human capital and the parameter β_4 is used to determine the level of human capital. So, the study expects a positive and significant relationship between FDI and human capital.

Inflation: One way to measure the stability of the host economy is a stable macroeconomic environment in which inflation serves as one of the indicators. Meanwhile, during the 1980s and 1990s, many developing countries experienced high levels of inflation rates. Foreign investors are particular about a stable macroeconomic environment that can increase their level of confidence in such economy. Therefore, low inflation histories are a good signal to investors about the level of commitment and credibility of the government. This implies that high and unstable inflation rates, usually, creates uncertainty for investors. Several empirical studies have supported the fact that macroeconomic instability is unfavourable to FDI attraction, for instance, Asiedu (2006). Following the literature, the study used the annual change in the consumer price index in per cent (CPI) to proxy inflation and the parameter β_5 is used to capture the inflationary rate in the study. Thus, the study expects a negative and significant relationship between FDI and inflation.

Financial Development: A well-functioning financial development of a host country can actively determine the quality of institutions, government policies, income level and cultural characteristics. Therefore, foreign investors may be attracted to the country where there are sophisticated and superb technological financial systems. Though, this is because; they want to ensure there is adequate security for their money and more so; there is ease of repatriation of profits to the home country. The study use domestic credit to the private sector as a per cent of GDP is used as a proxy for financial

development and the parameter β_6 is used to determine the level of financial development. According to Hermes and Lensink (2003) a more developed financial system has a positive effect on the process of technological diffusion that FDI brings to the host country. Therefore, the study expects a positive and significant relationship between FDI and financial development.

3.2. Model Specifications

To identify the drivers of FDI inflows into SSA countries, the study adopts Pooled Mean Group (PMG) estimator introduced by Pesaran et al. (2001) in an autoregressive distributive lag, (ARDL) (p, q) framework as follows:

$$FDI_{it} = \sum_{j=1}^p \beta_{1ij} FDI_{i,t-j} + \sum_{j=0}^p \beta_{2ij} MKT_{i,t-j} + \sum_{j=0}^p \beta_{3ij} OPEN_{i,t-j} + \sum_{j=0}^p \beta_{4ij} HC_{i,t-j} + \sum_{j=0}^p \beta_{5ij} INF_{i,t-j} + \sum_{j=0}^p \beta_{6ij} FD_{i,t-j} + \mu_i + u_{it} \quad (1)$$

where: $i = 1, 2, 3, 4, \dots, 10$ (countries); $t = 1, 2, 3, 4, \dots, 31$ (time periods); FDI = log of foreign direct investment to GDP ratio (FDI/GDP); MKT = log of market size proxy as real GDP per capita; $OPEN$ = log of openness (export+import/GDP); HC = log of human capita proxy as secondary school enrolment rate; INF = annual inflation rate (%); FD = log of financial development (domestic credit to the private sector as % of GDP); μ_i = denote the country specific effects; u_{it} = denotes the remainder disturbance and it is assumed that u_{it}^s are independently distributed across i and t , with zero means and variance $S^2 > 0$; i = index cross-section dimension; t = time series dimension.

$\beta_{2ij}, \beta_{3ij}, \dots, \beta_{6ij}$, are $k \times 1$ coefficients vectors of the first difference of explanatory variables and their lagged value. While β_{1ij} represent the scalar coefficient of the lagged dependent variables. All the explanatory variables contained in this model under this section are in line with the previous studies such as (Asiedu, 2002; Kamay, 2002; Campos and Kinoshita, 2003; Anyanwu, 2011; and Guesmi and Teulon, 2014). The lag order of ARDL is selected based on Schwartz-Bayesian Criterion. The re-parameterised form of (1) can be written as follow:

$$\Delta FDI_{it} = \psi_i (FDI_{i,t-1} - \phi_i' X_{it}) + \sum_{j=1}^p \beta_{1ij} \Delta FDI_{i,t-j} + \sum_{j=0}^p \beta_{2ij} \Delta MKT_{i,t-j} + \sum_{j=0}^p \beta_{3ij} \Delta OPEN_{i,t-j} + \sum_{j=0}^p \beta_{4ij} \Delta HC_{i,t-j} + \sum_{j=0}^p \beta_{5ij} \Delta INF_{i,t-j} + \sum_{j=0}^p \beta_{6ij} \Delta FD_{i,t-j} + \mu_i + u_{it} \quad (2)$$

Where parameter ψ_i indicates the error-correcting the speed of adjustment term and if $\psi_i = 0$, then there would be no evidence for a long-run relationship. Hence, the parameter is expected to be significantly negative with the assumption that the variables show an adjustment to a long-run relationship between the variables. More so, this parameter Δ indicates the first difference.

3.3. Justification of the country selection

A panel data for 10 selected Sub-Saharan African countries during the period 1999-2023 were used in this study. The countries selection was based on the following criteria: i) The countries are a member of SSA region; ii) All the selected countries fall

under West African Economic and Monetary Union (WAEMU), Central African Economic and Monetary Community (CEMAC), Common Market for Eastern and Southern Africa (COMESA), East African Community (EAC), Southern African Development Community (SADC), Southern Africa Customs Union (SACU) and Economic Community of West African States (ECOWAS); iii) A balanced mix of income classification group (i.e. Low income, lower middle income, upper- middle and higher income; iv) Availability of data. These above criteria led to the selection of these countries; Botswana, Cameroon, Ghana, Kenya, Malawi, Mauritius, Nigeria, Rwanda, South Africa, and Senegal. According to World Bank 2023 report, the country's Gross National Income (GNI) per capita were grouped as follows; low income; \$1,145 or less, lower middle income; \$1,146-4,515, upper middle income; \$4,516-14,005, higher income; \$14,005 or more. The countries GNI and groupings are contained in the table 1 below:

Table 1. Country GNI data used in the analysis and their grouping categories

S/No.	Countries Name	GNI per capita, PPP (US\$) as at 2022	GNI per capita grouping	Member Regional Grouping
1	Botswana	19,287	Upper Income	SACU
2	Cameroon	4,064	Lower Middle income	CEMAC
3	Ghana	6,500	Upper Middle Income	ECOWAS
4	Kenya	6,178	Upper Middle Income	EAC
5	Congo	610	Low Income	COMESA
6	Mauritius	22,240	Upper Income	SADU
7	Nigeria	5,459	Upper Middle Income	ECOWAS
8	Rwanda	2,494	Lower Middle income	COMESA
9	South Africa	15,331	Upper Income	SADU
10	Senegal	3,768	Lower Middle income	WAEMU

Source: World Bank Development Indicators; World Bank report released as at July, 2024.

3.4. Econometric Techniques

3.4.1. Panel Unit Root Tests

Panel unit root tests are employed to take care of nonstationary variables used for this study. The use of panel unit root tests has gained wider acceptance in the empirical literature because most macro-economic data are spurious in nature and cannot be used to estimate the growth equation without converting them to a stationary state. Meanwhile, economic researchers believed that panel unit root tests with regards to both time series and cross-sectional nature of the data are statistically stronger than the time series unit root tests. However, time series unit root tests only give information about time dimension (see, Levin, Lin and Chin, 2002; Pesaran, 2006). Some of the previous empirical researches on the use of panel unit root test include (Al-Iriani, 2007; Flora and Agrawal, 2014; Omojolaibi, 2014). The panel unit root test advanced by Quah (1992) does not accommodate heterogeneity across groups such as individual specific effects and different patterns of residual serial correlations. While, Levin and Lin (1993) test

are more generally applicable because it allows for individual specific effects as well as dynamic heterogeneity across groups (Im et. al., 2003). The Im, Pesaran and Shin (2003) panel unit root tests that allow for both heterogeneous and balance panel is also used in this study. The study also adopted (Levin, Lin, and Chu, 2002) that cater for heterogeneous across groups such as; individual specific effects and different patterns of residual serial correlations. Maddala and Wu (1999) proposed the use of the Fisher (p λ) test which is based on combining the p-values of the test-statistic for a unit root in each cross-sectional unit and is suitable to use for this study.

3.4.2. Panel Cointegration Test

Once the issue of nonstationary has been resolved, and the order of stationary is defined, the study now proceed to test the long-run association that exists among the variables. The study used panel cointegration tests proposed by Pedroni (2004) to determine the long-run economic relationship among the variables. The Pedroni panel cointegration method takes account of heterogeneity by using specific parameters that allowed varying across individual country members in the study. Taking into account, such heterogeneity constitutes an advantage because it is unrealistic to assume that the vectors of cointegration are identical from an individual to another for the panel. To proceed with the use of Pedroni's cointegration test, the study computes the regression residuals from the hypothesized cointegration regression model as follows;

$$y_{it} = \alpha_i + \delta_{it} + \beta_{1i}x_{1,it} + \beta_{2i}x_{2,it} + \beta_{Mi}XM_{1,it} + \varepsilon_{it} \quad (3)$$

for $i = 1, \dots, N$; $t = 1, \dots, T$; $m = 1, \dots, M$

where N refers to the number of countries in the panel; T refers to the number of years under observation over time and M refers to the number of explanatory variables. The slope of coefficients $\beta_{1i}, \beta_{2i} \dots \beta_{Mi}$ is permitted to change across the individual members of the panel. Thus, the parameter α_i is the fixed effect that also allows varying across the individual members. The deterministic trends which are specific to individual members of the panel are captured by δ_{it} . The residuals ε_{it} are structured as follows:

$$\dot{\varepsilon}_{it} = \dot{\rho}_i \dot{\varepsilon}_{it-1} + \dot{u}_{it} \quad (4)$$

Pedroni (1999; 2004), Suggested seven different residual-based panel cointegration tests for testing the null hypothesis of no cointegration. The four are based on "within" dimension (i.e. panel-v, panel-p, semi-parametric panel-t, and parametric panel-t) statistics is calculated by adding up the numerator and the denominator over N cross-sections separately. The three "between" dimension based (i.e. group-p, semi-parametric group-t and parametric group-t) statistics is calculated by dividing the numerator and the denominator before summing up over N cross-sections. Both within and between dimensions are used to test the null hypothesis of no cointegration.

3.4.3. Westerlund Panel Cointegration

The common-factor restrictions that required that the long-run parameters for the variables in their levels are equal to the short-run parameters for the variables in their first difference is a strong limitation most residual-based cointegration tests including Pedroni cointegration test possessed. In response to this limitation, Westerlund (2007) developed four new panel cointegration that are based on structural rather than residual dynamics and, therefore, do not impose any common-factor restriction (Persyn and Westerlund, 2008). In this case, Westerlund panel cointegration uses error-correction term by testing the null hypothesis of no cointegration by examined if the error-correction term in a panel error-correction model is equal to zero. Apart from the advantage of non-common factor restriction, the cointegration tests are assumed to be normally distributed, also suitable to accommodate unit-specific short-run dynamics, trend and slope parameters, and cross-sectional dependence. In this case, Westerlund panel cointegration uses bootstrap approach to account for cross-sectional dependence that may be present in the cross-sections. According to Persyn and Westerlund (2008), to compute the panel cointegration tests, three steps must be followed; the first step is the computation of the group-mean tests as follows:

$$\Delta \tilde{y}_{it} = \Delta y_{it} - \delta'_i d_t - \tilde{\theta}'_i x_{i,t-1} - \sum_{j=1}^{\rho_i} \hat{\alpha}_{ij} \Delta y_{i,t-1} - \sum_{j=-q_i}^{\rho_i} \hat{\gamma}_{ij} \Delta x_{i,t-1} \quad (5)$$

$$\tilde{y}_{i,t-1} = y_{i,t-1} - \delta'_i d_t - \tilde{\theta}'_i x_{i,t-1} - \sum_{j=1}^{\rho_i} \hat{\alpha}_{ij} \Delta y_{i,t-1} - \sum_{j=-q_i}^{\rho_i} \hat{\gamma}_{ij} \Delta x_{i,t-1} \quad (6)$$

The second step is to make use of $\Delta \tilde{y}_{it}$ and $\tilde{y}_{i,t-1}$ in estimating the common error-correction parameter, α , and its standard error as follows:

$$\hat{\alpha} = (\sum_{i=1}^N \sum_{t=2}^T \tilde{y}_{i,t-1}^2)^{-1} \sum_{i=1}^N \sum_{t=2}^T \frac{1}{\hat{\alpha}_{i(1)}} \tilde{y}_{i,t-1} \Delta \tilde{y}_{it} \quad (7)$$

The standard error of $\hat{\alpha}$ is as follows:

$$SE(\hat{\alpha}) = ((S_N^2) \sum_{i=1}^N \sum_{t=2}^T \tilde{y}_{i,t-1}^2)^{-\frac{1}{2}} \quad (8)$$

The third step is to compute the panel statistics as follows:

$$P_T = \frac{\hat{\alpha}}{SE(\hat{\alpha})}, P_\alpha = T \hat{\alpha} \quad (9)$$

3.4.4. Pooled Mean Group, ARDL Model

Basically, the Pooled Mean Group autoregressive distributive lag is a dynamic error correction model developed by Pesaran et al. (2001) that allows the short-run parameters and error variances to differ across the countries. At the same time, PMG restricts the long-run coefficients to be identical across the cross-section units but allows the short-run coefficients and the regression intercept to be country specific. The autoregressive distributive lag (ARDL) model part of the pooled mean group as proposed by Pesaran et al. (2001) is used to estimate the short run parameters in a lag form. An alternative estimation method is Mean Group (MG) estimator developed by Pesaran and

Shin (1995) which involves estimation of separate equations for each country and the computation of the mean estimates, without imposing any constraint on the parameters. To this end, imposing invalid parameter homogeneity in dynamic models typically may lead to biased estimates of the speed of adjustment (Pesaran and Smith, 1995).

This section of the study relies on the pooled mean group estimator which is useful when the long-run is given the expected conditions of homogeneity across the countries while the Short-run adjustment relies on the region characteristics such as general-market imperfections, corruption, high inflationary rate, and vulnerability of external and domestic shocks. For the purpose of comparison between, the PMG and MG, the study tested the homogeneity of the long-run coefficients between PMG and MG using the Hausman test (1978). However, the Hausman test is based on the null hypothesis that the two set of coefficients generated by the PMG and MG estimators are not statistically different Mahony and Vecchi (2003). According to Pesaran et al. (1999), under the null hypothesis, the PMG are consistent and more efficient than the MG estimators. In this case, the pooled mean group is consistent when the following assumptions are observed; (1) the PMG estimates must be independent of the regression residuals across the countries (2) The country-specific effects must be accounted for in the estimation. The study control for country-specific effects by allowing for specific intercept for each country (3) The existence of long-run relationship requires an error-correction term to be within the circle, that is, it must be negative and not lower than -2 (dynamic stability condition). The last PMG specification condition is that the long-run parameters must be the same across countries.

3.4.5. Panel Granger Causality

The essence of cointegration is to show the existence of the long-run relationship between variables, but it does not indicate the direction of the causality relationship. In view of this, Granger (1988) noted that if a set of variables is co-integrated; there must be a need to test the direction of causality, which implies adopting the Granger causality test in such a panel VAR structure. In this study, the modern panel causality test introduced by Dumitrescu and Hurlin (2012) was adopted to test for heterogeneous panel data models. The use of this test method was evidenced in the recent literature (see, Akbas and Sancar, 2013; Zeren and Ari, 2013; Ndoricimpa, 2014; Liddle and Messinis, 2015). This test is a simple version of the Granger (1969) non-causality test for Heterogeneous panel data. The test assumes that cross-sectional dependency does not exist. Meanwhile, Akbas and Sancer (2013) affirmed that "yet, the Monte Carlo simulations show that even under the conditions of cross-sectional dependency, this test can produce strong results". Also, the test assumes two different distributions; (1) asymptotic distribution which is applicable when the time series is greater than the number of observations ($T > N$) such as in the case of this study, (2) semi-asymptotic distribution when $T < N$. This test is also based on normal distribution and allows for heterogeneity in Granger causality model. In this case, the linear model below is considered:

$$y_{it} = \alpha_i + \sum_{k=1}^K \gamma_i^{(k)} y_{i,t-k} + \sum_{k=1}^K \beta_i^{(k)} x_{i,t-k} + \varepsilon_{it} \quad (10)$$

Where α_i is the individual effects that assumed to be fixed in the dimension, K indicates the lag length that is assumed to be identical for all cross-section units of the panel, $\gamma_i^{(k)}$ is the autoregressive parameter, and $\beta_i^{(k)}$ is the regression coefficient to vary across groups. This is different from Nair-Reichert and Weinhold (2001) where the parameters $\gamma_i^{(k)}$ and $\beta_i^{(k)}$ are constant in time. More so, according to Dumitrescu and Hurlin (2012), the model in equation (10) is also different from Swamy (1970) whose coefficient model is random in nature.

4. RESULTS AND DISCUSSION

4.1. Panel Unit Root Tests

The four major panel unit root tests (LLC, IPS, ADF and PP) that were commonly used in the literature were employed to test the stationarity of the macroeconomic data used in this study. Results in Table 2 showed there are mixed results in the panel unit root tests at the level in both trend and without trend at the 5 per cent significance level. For instance, Inflation (INF) is stationary at the level $I(0)$ while other variables are stationary at the first difference $I(1)$ at the 5 per cent significant level. In this case, when variables are integrated into the mixture of $I(0)$ and $I(1)$, the best econometric method that is suitable for determining the long-run coefficient of the variables is pooled mean group (PMG) has suggested by Pesaran et al. (2001).

Table 2. Panel Unit Root Tests Results (level & first difference)

Variable	WITHOUT TREND				WITH TREND			
	LLC	IPS	ADF-Fisher	PP-Fisher	LLC	IPS	ADF-Fisher	PP-Fisher
FDI	16.13 (0.78)	10.23 (0.91)	10.14 (0.96)	1.11 (0.98)	12.12 (0.97)	11.22 (0.99)	8.17 (0.99)	11.04 (0.97)
MKT	6.45 (0.98)	6.49 (0.90)	1.71 (0.91)	1.54 (0.90)	1.77 (0.96)	3.69 (0.99)	4.13 (0.99)	3.77 (0.98)
OPEN	13.13 (0.92)	14.06 (0.99)	0.17 (0.87)	0.06 (0.91)	8.45 (0.91)	8.79 (0.98)	4.39 (0.92)	0.36 (0.89)
HC	8.01 (0.91)	10.15 (0.97)	2.07 (0.93)	2.67 (0.96)	3.52 (0.99)	6.12 (0.95)	7.80 (0.90)	7.14 (0.99)
INF	-5.13 (0.01)*	-4.55 (0.02)*	91.24 (0.00)*	98.70 (0.01)*	-4.76 (0.01)*	-4.28 (0.02)*	85.15 (0.00)*	32.15 (0.00)*
FD	1.97 (0.97)	2.04 (0.97)	13.71 (0.84)	12.96 (0.87)	0.82 (0.79)	1.97 (0.97)	12.67 (0.89)	15.36 (0.75)
first difference								
FDI	-0.16 (0.01)*	-2.14 (0.01)*	89.64 (0.01)*	82.77 (0.01)*	-5.30 (0.02)*	-7.27 (0.00)*	14.30 (0.00)*	29.10 (0.02)*
MKT	-11.66 (0.00)*	-9.90 (0.00)*	135.42 (0.00)*	149.80 (0.00)*	-12.74 (0.00)*	-10.66 (0.00)*	38.94 (0.00)*	26.10 (0.00)*
OPEN	-2.25 (0.00)*	-4.33 (0.00)*	83.59 (0.00)*	112.44 (0.00)*	-5.97 (0.00)*	-7.85 (0.00)*	106.78 (0.00)*	474.01 (0.00)*
HC	-5.97 (0.00)*	-5.85 (0.00)*	91.71 (0.00)*	109.19 (0.00)*	-7.72 (0.00)*	-7.23 (0.00)*	95.68 (0.00)*	10.43 (0.00)*
INF	-19.26 (0.00)*	-19.28 (0.00)*	42.17 (0.00)*	83.75 (0.00)*	-17.18 (0.00)*	-17.48 (0.00)*	38.70 (0.00)*	13.18 (0.00)*
FD	-13.62 (0.00)*	-13.53 (0.00)*	71.34 (0.00)*	22.18 (0.00)*	-12.45 (0.00)*	-13.61 (0.00)*	65.31 (0.00)*	29.38 (0.00)*

Notes: The numbers in parenthesis with asterisk are p-values at the 5 per cent significant level, and all the variables in the table are in natural log form except inf (inflation) and fd (financial development). *Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. *Automatic lag length selection based on Schwarz Info Criterion (SIC) with lag of 6 was used for the unit root test.

4.2 Pedroni Panel Cointegration Test

The results of the Pedroni cointegration tests are summarised below in Table 3. The findings showed that there was cointegration among all the variables that were tested for attracting FDI inflows to SSA region at 5 per cent significant level. The study also confirmed that a long-run co-integration relationship exists among all the variables of which the null hypothesis of no cointegration between FDI, GDP, OPEN, HC, INF and FD is rejected based on the 5 per cent significant level.

Table 3. Pedroni panel cointegration test results

Test Statistics	Without Trend		With Trend	
Panel cointegration (Within Dimension)				
	Statistics	P-Values	Statistics	P-Values
Panel v-statistic	-0.25	(0.43)	-2.68	(0.95)
Panel ρ -statistic	-0.45	(0.63)	0.59	(0.72)
Panel PP-statistic	-3.19	(0.01)*	-5.15	(0.00)*
Panel ADF-statistic	-3.41	(0.02)*	-4.59	(0.00)*
Group mean panel cointegration (Between Dimension)				
Group ρ -statistic	0.21	(0.58)	0.95	(0.13)
Group PP-statistic	-7.16	(0.01)*	-8.87	(0.00)*
Group ADF-statistic	-4.11	(0.01)*	-3.50	(0.02)*

Notes: (a) An automatic lag length selection based on Schwarz Info Criterion (SIC) with a maximum lag of 6 was used in the calculation of the seven Pedroni statistics. Based on the 5 per cent significant level, the Pedroni statistics imply the rejection of the null hypothesis of no cointegration.

4.3. Westerlund Panel Cointegration

Table 4 show the results from the Westerlund (2007) panel cointegration test that avoids the common factor restriction issue and test the null hypothesis with the condition that the error-correction term is equal to zero. Therefore, when the null hypothesis of no error-correction is rejected, this implies the existence of a long-run relationship among the variables. From the results, the two panel tests out of four indicate that the mean group tests (H_1) confirm the existence of cointegration for at least one cross-section unit. The null hypothesis of cointegration (H_0) is tested by the panel statistics P_t and P_a against the alternative (H_1) of the panel cointegration G_t and G_a . One of the characteristics of Westerlund (2007) is that it presents the p-values robust against

cross sectional dependence through a bootstrapping approach which allows for heterogeneity at different levels. The results in the table reject the null hypothesis of no cointegration at the 5 per cent level of significance except G_t test statistics. The null hypothesis that implies no cointegration is then rejected in three out of four levels of statistics with the 5 per cent significance level from the bootstrapped p-values; this indicates that cross-sectional dependence is allowed. The bootstrapped p-values are an indication of the existence of strong co-integration among foreign direct investment, market size, trade openness, human capital, inflation and financial development.

Table 4. Results of Westerlund-2007 panel cointegration tests

Statistic	Value	p-value	Robust p-value
G_t	-1.16	0.00*	0.37
G_a	-1.26	0.99	0.01*
P_t	-4.18	0.01*	0.02*
P_a	-3.22	0.95	0.00*

Notes: The Akaike Information Criterion (AIC) with maximum lag/lead length of 1 is used for optimum lag length selection. Bootstrapped p-values robust against cross-sectional dependences are obtained by setting the bootstrap value to 200.

4.4. Pooled Mean Group, ARDL results of the determinants of FDI in SSA countries

In order to identify the factors that can significantly influence FDI inflows to the SSA region based on the 10 selected countries for the period of 1999-2023; the study employed the pooled mean group (PMG) estimator for the empirical estimation. In the long-run, all the determinant variables have the expected sign and significant except market size and inflation that were insignificant to explain FDI inflows to SSA region.

Table 5 reports the results of the PMG and MG estimation methods. For the purpose of comparison, mean group (MG) result is also reported. Meanwhile, the result of Hausman test show a probability greater than 0.05, that is, 0.97, this signifies that the null hypothesis of the long-run homogeneity restriction does not reject. To buttress this point, Sub-Saharan African countries possess homogeneity characteristics such as; high unemployment rate, high inflation rate, high rate of poverty, and so on. To determine the long-run coefficients of the FDI determinants variables, the PMG result is reported. Meanwhile, the long-run period is when all the factors of production and costs are varied. This implies that in the long run, foreign investors are able to adjust to all the costs incurred whereas; in the short run; at least, one of the inputs in the factor of production is allowed to be fixed while others are varied. Therefore, the long-run coefficients of FDI results show that the market size proxy by GDP per capita is insignificant to explain the flows of FDI into SSA region. Meanwhile, the role of GDP per capita is to send a signal to the foreign investor about the purchasing capacity of the available consumers within a given country. In this case, the insignificant result is not surprising because the region is characterised with a lower GDP per capita used as a proxy for market size. In the same way, trade openness coefficient indicates a positive and significant relationship with FDI, that is, a 1 per cent increase in the level of trade openness in Sub-Saharan Africa countries leads to increase in the ratio of FDI per GDP by 0.68 per cent. The result

agreed with the hypothesis that trade openness has a significant positive influence on the inflows of FDI to SSA region. The estimation result is consistent with the previous empirical findings in the literature (see, Asiedu, 2002; Onyeiwu, 2003; Onyeiwu and Shrestha, 2004; Anyanwu, 2011) who all proved that countries that are highly opened are more likely to attract a higher proportion of FDI than a closed economy. In an opened economy, the bottleneck that involves in getting business permit, high tariff and non-tariff would be considerably affordable by the foreign investor with ease.

In the case of human capital, the findings revealed that a 1 per cent increase in human capital investment in Sub-Saharan Africa countries leads to increase in the ratio of FDI per GDP by 2.60 per cent. To this end, the empirical result is in line with the hypothesis that investment in the quality human capital has a significant positive influence in attracting FDI inflows to SSA region. The implication of this is that, a country with a high level of literate and skilled manpower can easily adjust to the trend of new technology, and the probability of the increase in productivity at work is likely to be very high. In this case, foreign investors may be attracted by this high level of skilled labour provided the cost of hiring them is moderate and affordable by foreign investors. This result of investment in human capital is in agreement with the previous findings by Miyamoto (2003) that the level of human capital in the host country is a crucial factor for foreign investors (MNCs) when making a location decision as it reduces the costs of hiring foreign labour and unnecessary costs of training employees. Previous empirical works by (Noorbakhsh et al., 2001; Nunenkamp, 2002; Asiedu, 2002; Kinoshita and Campos, 2004) were also found human capital as a crucial factor to be a significant determinant of FDI inflows confirming earlier work by (Root and Ahmed, 1979; Schneider and Frey, 1985). The finding further revealed that the coefficient of inflation is insignificant to explain the flow of FDI to SSA region. This finding contradicts the previous studies that proved that inflation is always negative and significant to explain the direction of FDI inflows. For instance, (see, Schneider and Frey, 1985; Apergis and Katrakilidis, 1998; Onyeiwu and Shrestha, 2004).

Also, financial development is significant and positive to explain the determinants of FDI to SSA region. That is, 1 per cent increase in financial development in Sub-Saharan Africa countries leads to increase in the ratio of FDI per GDP by 0.02 per cent in attracting FDI inflows to SSA region. This result is an indication that the credit to the private sector is an inducement that the potential foreign investors may consider in investing their resources in the host country. Financial development plays a major role in promoting foreign investment because there must a security for the investors' money and more so, in case there is a need to source for fund in the host economy, this opportunity must be available. This finding is in support of Hermes and Lensink (2003) that a more developed financial system has a positive effect on the process of technological diffusion that FDI brings to the host economy.

In the short run, the lagged value of FDI is significant and positive to explain the determinants of FDI inflows to SSA region. This implies that the performance of the existing foreign investors in the host nation is also a factor to explain FDI inflows to the region. In this case, 1 per cent increase in previous FDI in Sub-Saharan African countries leads to increase in the ratio of FDI per GDP by 0.29 per cent in attracting FDI inflows to SSA region. Also, the lagged value of trade openness is positive and significant to

explain the flows of FDI into the region. This indicates a 1 per cent increases in previous trade openness in Sub-Saharan African countries leads to increase in the ratio of FDI per GDP by 0.13 per cent in attracting FDI inflows to SSA region. In the same vein, a 1 per cent increases in previous financial development in Sub-Saharan Africa countries leads to increase in the ratio of FDI per GDP by 0.07 per cent in attracting FDI inflows to SSA region. More so, the negative and significant value of -0.54 indicates the speed of adjustment of the error correction estimates. This value indicates that 54 per cent of the disequilibrium in the current period (t) was corrected in the previous period (t-1).

Table 5. Pooled Mean Group, ARDL results of the determinants of FDI in SSA countries
Dependent Variable: FDI

Variables	PMG		MG	
	Coefficient	P-value	Coefficient	P-value
Long-run coefficients				
MKT	-0.08	(0.65)	-0.68	(0.23)
OPEN	0.68	(0.00)*	0.80	(0.02)*
HC	2.60	(0.00)*	-0.60	(0.50)
INF	-0.05	(0.32)	-0.2	(0.05)
FD	0.02	(0.00)*	0.01	(0.00)*
Error-correction term	-0.54	(0.00)*	-0.27	(0.00)*
Short-run coefficients				
Δ FDI (1)	0.29	(0.02)*	0.21	(0.03)*
Δ MKT (1)	0.05	(0.06)	-0.11	(0.37)
Δ OPEN (1)	0.13	(0.01)*	0.14	(0.06)
Δ HC (1)	-0.16	(0.54)	-0.25	(0.06)
Δ INF (1)	-0.02	(0.82)	0.05	(0.07)
Δ FD (1)	0.07	(0.00)*	0.01	(0.00)*
No. of observation	10			
Hausman Tests Prob>Chi2(5) = 0.97				

Notes: All the variables are expressed in natural logarithms. The p-values are asterisk at 5 per cent significant level. The value of Hausman tests indicates the p-values for test of equivalence of PMG and MG. If the null hypothesis is accepted (that is, p-value greater than 0.05), it can be concluded that PMG is consistent and performs better than MG.

4.5. Panel Granger Causality Test Results

The causality test developed by Dumitrescu and Hurlin (2012) is found to be a useful Granger causality test that can give an efficient and successful results, even under the conditions of cross-sectional dependence. As discussed by Granger (1969), the causality test in panel data is to show "if some variable, say X causes another variable, say Y, everywhere in the panel". Therefore, the study employed the Dumitrescu and Hurlin (2012) to test the panel Granger homogeneous non-causality (HNC) hypothesis, that is, no individual causality relationship from X to Y exists.

According to the results shown in Table 6, a bi-directional (MKT $\leftrightarrow$ FDI) causal relationship was found between MKT and FDI between the years 1999 and 2023 in SSA countries. The implication of the bidirectional relationship between MKT and FDI shows that a growing market size as proxied by GDP per capita is an important factor to induce more FDI inflows to SSA region. This is because an increase in GDP per capita shows that the host economy is financially healthy and this will definitely boost foreign investors' confidence and attract them to the host economy. Also, the inflows of foreign

direct investment (FDI) can also grow the size of the market because of the benefits that it (FDI) will bring to the host economy. Meanwhile, such benefits may come in the form of more employment opportunities, transfer of foreign skills and so on. The result of the unidirectional (OPEN→FDI) relationship between OPEN and FDI imply that an open economy attracts more foreign investors. This was established in the empirical literature that countries with fewer barriers to foreign investment and trade will enhance more FDI inflows (see, Asiedu, 2002; Anyanwu, 2011). Meanwhile, the causality results also showed that FDI is not an important factor to cause a country to be more opened.

Similarly, a bi-directional (HC↔FDI) causal relationship was found between HC to FDI for the same period. This result indicates that a country with more skilled workers and high-level manpower at a lower cost have the tendency to attract more FDI inflows into SSA region. Similarly, FDI could also act as an engine for human capital development through spillover effects of foreign knowledge and technology transfer from other workers in the home country to the host economy. Also, the result of no causal relationship between FDI and INF show that inflation cannot offer any benefit for FDI. In fact, it was empirically concluded in the literature that inflation is detrimental to foreign investment (Onyeiwu and Shrestha, 2004). For instance, a country with high level of inflation tends to discourage the foreign investors because the cost of purchasing raw materials and other needed facilities for investment will also be high.

A uni-directional (FD→FDI) relationship was found between FD and FDI that is FD causes FDI and not vice versa. This result shows that a well-functioning financial development of a host country in terms of credit to local firms can act as an inducement for foreign investors. In this case, the foreign investors would be more confident in the financial sector of the host economy particularly when there is a need for them to access the credit facilities of the host nation. At the same time, the goal of the foreign investors is not only in the profit generation but also in the security of their funds. More so, the unidirectional (OPEN→MKT) causal relationship running from OPEN to MKT indicates that the benefits that accrued from an open economy in terms of employment opportunities, managerial skills and foreign knowledge can have a positive impact on the MKT. The Granger causality test results also revealed that HC and MKT (HC↔MKT) have displayed a bidirectional relationship. The effect of this is that SSA region has shown that with a high level of manpower and modern skilled workers, this could trigger the MKT to increase. In the same vein, high MKT size could also boost the level of human capital in the region because large market size implies more qualified trainers/teachers to improve the skills of the workers available in the country. Similarly, the result of no causal relationship between MKT and INF also implies that in the SSA region, both INF and MKT size could not impact in any direction on each other.

Again, FD and MKT indicates a unidirectional relationship (FD→MKT), that is, MKT causes FD and not vice versa, this implies that credit to local investors could influence the size of the market. Meanwhile, large market size could also boost the level of financial development in the form of credit available to local investors because there would be a high turnover of cash. That is, large market size coupled with low interest rate prevents idle cash in the SSA region. Also, the bidirectional (HC↔OPEN) relationship between HC and OPEN indicates that countries that are more open would surely attract a high level of foreign skilled workers that are needed for growth and

development. This is very crucial particularly in SSA region where economic growth, development and improvement in the standard of living are still a major priority. In the same vein, more skilled workers available in the country can help to thoroughly administer the various openness policies, thereby, prevent likely negative consequences of open an economy to the world.

A uni-directional (INF→OPEN) relationship was found between INF and OPEN that is INF causes OPEN and not vice versa. Since inflation arises when there is excess money chasing few goods, as a result of this, a country can decide to adopt a more open policy that can bring a strong competition between local and foreign investors in order to cause price fall. In a situation where there are many choices to be made by the consumers, this might cause a decrease in the price of goods and services. In the same context, a similar uni-directional (FD→OPEN) relationship was found between FD and OPEN, that is FD causes OPEN and not vice versa. A well-functioning and viable financial development via financial institutions can boost the level of openness of a country. For instance, an easy way of the foreign exchange rate of a country currency with another currency may imply the degree of openness of such country.

There is no causal relationship found between INF and HC. This signifies that inflation is not a factor that determines human capital. In fact, a high/low level of inflation cannot cause the growth and improvement of human capital. The cost of acquiring the necessary human capital development is determined by demand and supply among other factors. In the same manner, the growth in human capital could not in any way affect the movement of inflation. Financial development proxy by credit to local investors shows in the finding that it causes human capital. This simply indicates that sufficient credit to the local investor will enhance efficiency and productivity, particularly when workers have access to seasonal training and workshops. In a situation where the overall human capital has increased through consistent training, this could boost the foreign investors' confidence in investing in such country. Similarly, highly skilled manpower in SSA region has the capacity to improve the standard of modern financial development. High level of human capital is required in the financial sector because today's technologies are highly sophisticated. Also, a bidirectional (FD↔HC) relationship was found between FD and HC. The implication of this bidirectional relationship is that high level of human skills available in a country can boost the level of financial development in that country. However, improvement in the financial development can also improve human capital through training and workshops.

Table 6. Dumitrescu-Hurlin panel Granger causality results

Null Hypothesis	Test Statistics W^{HNC}	Z_{NT}^{HNC}	Prob	Conclusion
MKT does not homogeneously cause FDI	1.13	11.19	0.00	Reject Ho
FDI does not homogeneously cause MKT	2.16	3.18	0.00	Reject Ho
OPEN does not homogeneously cause FDI	1.81	2.56	0.00	Reject Ho
FDI does not homogeneously cause OPEN	0.15	-0.23	0.62	Do not Reject Ho
HC does not homogeneously cause FDI	2.12	0.13	0.00	Reject Ho
FDI does not homogeneously cause HC	1.37	1.50	0.00	Reject Ho
INF does not homogeneously cause FDI	1.63	1.09	0.27	Do not Reject Ho
FDI does not homogeneously cause INF	0.90	-0.33	0.73	Do not Reject Ho

FD does not homogeneously cause FDI	1.01	1.14	0.00	Reject Ho
FDI does not homogeneously cause FD	1.42	0.67	0.49	Do not Reject Ho
OPEN does not homogeneously cause MKT	1.08	4.31	0.00	Reject Ho
MKT does not homogeneously cause OPEN	0.76	1.05	0.11	Do not Reject Ho
HC does not homogeneously cause MKT	2.07	1.19	0.00	Reject Ho
MKT does not homogeneously cause HC	2.10	2.01	0.04	Reject Ho
INF does not homogeneously cause MKT	0.16	-0.40	0.68	Do not Reject Ho
MKT does not homogeneously cause INF	0.98	-0.17	0.86	Do not Reject Ho
FD does not homogeneously cause MKT	1.72	1.26	0.20	Do not Reject Ho
MKT does not homogeneously cause FD	1.05	1.20	0.00	Reject Ho
HC does not homogeneously cause OPEN	2.35	2.50	0.01	Reject Ho
OPEN does not homogeneously cause HC	2.40	2.59	0.00	Reject Ho
INF does not homogeneously cause OPEN	1.60	4.98	0.00	Reject Ho
OPEN does not homogeneously cause INF	1.47	0.78	0.43	Do not Reject Ho
FD does not homogeneously cause OPEN	1.26	1.24	0.00	Reject Ho
OPEN does not homogeneously cause FD	1.01	-0.11	0.90	Do not Reject Ho
INF does not homogeneously cause HC	0.96	-0.21	0.82	Do not Reject Ho
HC does not homogeneously cause INF	1.76	1.35	0.17	Do not Reject Ho
FD does not homogeneously cause HC	1.97	3.01	0.00	Reject Ho
HC does not homogeneously cause FD	2.17	2.10	0.00	Reject Ho

Notes: The significance level is taken to be 5 per cent. The approximated critical values for the average statistic $W_{N,T}^{HNC}$ are computed from Dumitrescu and Hurlin (2012) where $K = 1$.

4.6. Robustness check for determinants of FDI

For the purpose of the robustness check on the determinants factors affecting the inflows of FDI into SSA region, fully modified ordinary least square (FMOLS) and dynamic ordinary least square (DOLS) were used accordingly. From the results in Table 7, OPEN and FD are major significant factors to explain the inflows of FDI into SSA region. Meanwhile, from the four estimators, that is, PMG, MG, FMOLS and DOLS, trade openness and financial development stand out to be the factors that determined the inflows of FDI into SSA region. Also, the coefficient of human capital revealed a positive and significant result only in PMG.

Table 7. Robustness results for determinants of FDI in SSA countries

Dependent variable: FDI				
Variable	PMG Coefficient	MG Coefficient	FMOLS Coefficient	DOLS Coefficient
MKT	-0.08 (0.65)	-0.68 (0.23)	-0.60 (0.07)	-0.57 (0.87)
OPEN	0.28 (0.00)*	0.10 (0.02)*	0.24 (0.01)*	0.27 (0.00)*
INF	-0.05 (0.32)	-0.20 (0.05)	-0.01 (0.64)	-0.03 (0.44)
FD	0.12 (0.00)*	0.03 (0.00)*	0.02 (0.00)*	0.04 (0.00)*
HC	1.30 (0.00)*	-1.60 (0.50)	0.32 (0.17)	0.21 (0.05)
No. of countries	10			
Observation	310			

Notes: The estimation and analysis are based on probabilities at the 5 per cent significance level and the p-values are asterisk. For DOLS, the lag and lead selection are 1.

5. CONCLUSION AND POLICY RECOMMENDATIONS

Foreign direct investment (FDI) is one of the vital sources of capital inflows that can propel the growth and development of most developing countries of the world. Among other continents, Africa has been considered a region that needs FDI for the purpose of augmenting the capital needs, providing necessary employment, promoting the transfer of technology, and so on. The aftermath of the coronavirus in 2019 has also necessitated the need to readdress the determinants of foreign direct investment inflows to both developed and developing countries in the world. Also, based on the slow FDI growth in the region, researchers have been consistently conducting research on the need to ascertain the major drivers of foreign direct investment into SSA. On this note, this study reinvestigates the drivers of FDI inflows in Sub-Saharan African countries from 1999 to 2023. Panel data analysis was employed by using econometric techniques of pooled mean group, and the Dumitrescu-Hurlin panel Granger causality test. The Pedroni cointegration and Westerlund cointegration tests were used to test the long-run relationships among the variables employed in the study. To check for the robustness of the empirical results of the PMG, the mean group (MG) was used.

Based on the result of the PMG estimator, in the long term, it can be concluded that financial development, human capital, and trade openness are the drivers of FDI inflows in Sub-Saharan countries. However, in the short term, only the lagged value of FDI determines FDI inflows. These findings are in line with the opinion of Dunning's (1993) theoretical framework, which opined that location-specific factors determine the investor's decision. Also, it can be concluded that the SSA region is market-seeking. From the robustness checks using the mean group test, it can be concluded that trade openness and financial development are the major drivers of FDI inflows into the region in the long-run while the previous FDI inflows is significant in the short-run to explain the direction of FDI. From these results, the study recommends that SSA governments should create more trade and investment policies that gear towards liberalization of cross-border investments. Also, strengthening financial policies that promote FDI in the region. The investors must be assured that difficulties and administrative bottlenecks in profit repatriation are avoided. For future research, the study suggests that the drivers of foreign direct investment inflows are investigated in sub-sectors of Sub-Saharan African countries.

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