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Article

Global Financial Crisis (2007-2008) and Foreign Direct Investment (FDI) Inflows' Resilience to other Capital Flows in Sub-Sahara African (SSA) Countries

Onu King Ezebunwa[1]

1. Department of Economics, Faculty of Social Sciences, Ignatius Ajuru University of Education

Abstract: This study examines the effect of global financial crisis (2007-2008) on foreign direct investment inflows' resilience to other capital flows to selected Sub-Sahara African (SSA) Countries. This study was motivated by the assertion that foreign direct investment (FDI) inflows to developing economies are resilient than other capital inflows in 2007-2008 global financial crisis that originated in developed world. Specifically, the study ascertained whether foreign direct investment (FDI) inflow is significantly resilient than foreign portfolio investment (FPI) inflow in SSA. Using panel datasets from 26 SSA countries, the study explored non-stationarity and heterogeneous – based dynamic panel estimators namely, Mean Group (MG) and Pooled Mean Group to empirically implement the objectives. The findings of the study amongst others revealed significant evidence of the resilience of the inflow of foreign direct investment to SSA during the global financial crisis period of (2007 – 2008), contrary to the wide-spread assertion that developing economies are immune to the impact of the crisis. Also, we found that the foreign direct investment (FDI) inflow is significantly resilient than foreign portfolio investment (FPI) inflows in SSA. This study recommends the policies that may stabilize growth of FDI inflows. Thus, more foreign investors should be attracted which should increase investment opportunities and growth in the region. Greater attention should be given to FDI whenever global financial crisis is experienced.

Keywords: Global Financial Crisis, Foreign Direct Investment, Resilience, Foreign Portfolio Investment, Developing Economies, Sub-saharan Africa

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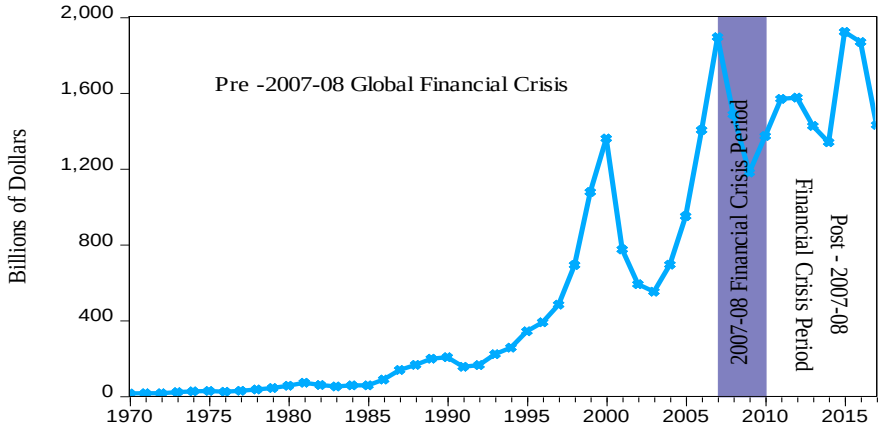
1. Introduction

The complex economic loop between countries all over the world have created a framework for interdependencies as demonstrated through travel, trade, migration, spread of cultural differences and dissemination of knowledge and understanding. The interdependency involves flow of capital, goods, resources and knowledge across border in order to create a sustainable and complementary set of organizational structures to manage the expanding network of international economic activity and transactions. Two decades ago, global capital flow increased, particularly globalization of Foreign Direct Investment (FDI). This confirmed the fact that less developed nations, where FDI has continuously been the most important and crucial part of capital inflows provided economic opportunities as well as technological capabilities [1].

Brunnermeier, Lane and Dani, consider capital flows as the financial counterpart to savings and investment decision, in line with the narrative of capital flowing "downhills" from capital-rich countries with lower rates of return to capital-poor countries with higher returns. As noted by Ahuja, (2013), capital is defined as financial resources available for investment in productive activities. Foreign capital therefore refers to the capital (both real and financial) that originates from outside the domestic economy [2].

Ndem, Okoronkwo and Nwamuo stated that composition of foreign investment flow to developing nations has shifted from commercial loans, ODA and workers' remittances to more of foreign direct and foreign portfolio investments due to inadequate records and passive nature of its operations. Thus, Obiechina noted that foreign portfolio investment did not display any record to show its activities. Therefore, for the purpose of this study, FDI and FPI would be examined but FDI given more prominent because it is more significantly different from FPI inflow in selected Sub-Sahara African (SSA) countries during (2007 – 2008) global financial crisis.

From the perspective of Sub-Sahara African (SSA) region, which according to Macias and Maasa, has enjoyed robust capital inflows over the past decades, figure 1 is a graphical representation of how FDI inflows to the region have fared over the years . It grew progressively from an average of $0.9 billion between 1970 and 1979 to about $1.3 billion between 1980 and 1989. By the 1990s, the average inflow of FDI to SSA has exceeded $4.7 billion with a wide margin compared to the size recorded in the 1970s and 1980s respectively. However, the financial and economic meltdown that originated in the advanced economies in August 2007, gradually spread to the developing countries, including SSA affected the flow of FDI in its second phase. For instance, in the immediate pre – financial crisis periods between 2000 and 2006/07, the FDI inflow to SSA appears to have fluctuated. The volatility trends that characterized the inflow of FDI to SSA in the twentieth century tend to have lingered to 2008. In conformity to the global inflows of FDI which reached its historical height of about $2 trillion in 2007, the inflows of FDI to SSA also reached its historical height of about $30 billion in 2007.



Source: Author's estimate based on UNCTAD database (www.unctad.org/fdi statistics)

Figure 1. Trends in Global FDI inflows (1970-2017).

Until 2008, the global FDI flows have generally increased since 2004 reaching its historical peak in 2007 as shown in Figure 1. Putting it differently, the upward movement in Figure 1 between 2004 and 2007 represents increase in the inflows of FDI from US$550.63 billion in 2003 to US$692.60 billion in 2004, US$948.93 billion in 2005, US$1403.55 billion in 2006, and US$1893.82 billion in 2007, respectively. This is mainly attributed to the financial meltdown that started in USA in the late 2007 and later manifested into global economic slowdown, following which was a sharp drop in the flow of global FDI in the year 2008 and 2009 [3]. The result of the tighter credit conditions and falling corporate profits, prompted many companies to announce production curtailed plans, laid off workers and cut capital expenditure. The literature replete with these argument as the basis for the consistent declines recorded in the inflow of global FDI between 2008 and 2009 [4].

The financial literature is replete with arguments that foreign direct investment has traditionally been less responsive to global financial crises than other forms of capital flows. This claim is against backdrop of the commonly held belief that foreign direct investment (FDI) was immune to the Latin American and Mexican crises of the 1980s, as

well as the East Asian financial crisis of the late 1990s and early 2000s [5]. The high interest mortgage crisis which gave birth to a recession era in United States of America in 2007-2008 was not expected to make an impact or be transmitted to developing economies. Consequently, the financial and economic catastrophe that resulted from the high-interest mortgage crisis was far worse than the Asian global financial crisis which occurred in the 1990s or the post-September 11 global financial disaster of 2001[6]. It was popularly agreed that the global financial crisis of 2007-2008 was the most severe crisis than the Great Depression in 1929 for the world's financial system. It harmed the Global real economy in ways that went beyond the financial sector (UNCTAD, 2012).

Many scholars are of the opinion that Africa would be spared the worst effects of the global financial crisis since its financial markets were not developed and fully integrated with global financial markets, and thus not fully exposed to "toxic prime assets" that is, the case in crisis-hit countries of western Europe and in particular, the United States. Africa's economy was mostly unaffected by the first phase of the global financial crisis, which began in 2008. Thus, research on the impact of the 2007 – 2008 global financial crisis on capital inflows to Africa, was lacking in the literature. Furthermore, a large body of research in the finance literature has shown that foreign direct investment was not affected by previous financial crises. For the most part, this school of thought is based on the idea that foreign direct investment (FDI) did not respond to the Latin America and East Asian crises of the 1980s and 1990s.

Despite the various policy measures taken by the developed countries to curb the menace of global financial crisis on foreign investment inflow, coupled with those measures taken by the developing or Sub-Sahara African (SSA) countries to protect their regions from the effect of global financial crisis, yet the SSA countries were affected in the second round or secondary period of the crisis. That means to say, the global financial crisis affected the SSA countries immediately after the crisis period (2007-2008) under study. In essence, the SSA countries started feeling the impact of global financial crisis in 2010 when the foreign direct investment (FDI) inflow began to dwindle (figure 1) as a result of the consequences of the policy measures taken by the developed world to reduce patronage of the trans-national companies on host communities in SSA.

1.1 Review of Literature

The desire of developing countries of the Sub-Sahara Africa to enhance the performance of the economy would be futile in the absence of foreign direct investment. In support of this, Lipsey (2004), defines FDI, "as a flow of foreign capital across national borders, from home to host countries, as measured by balance-of-payments numbers". Market size and growth rate (GDP), infrastructure, natural resources, and institutional variables like the country's political stability are all macro (country)-level factors that influence an economy's ability to attract foreign direct investment (FDI). Lipsey (ibid) argues 'that the microeconomic view analyzes FDI incentives from the investor's perspective. This is equivalent to considering an investment decision from a firm or industry-level perspective'. For the time being, the goal of this section is to offer reason for some of these FDI-determining factors in the empirical research that follows, which looks at FDI inflows to SSA. Foreign direct investment (FDI) relies on expected rates of return and risk, which is why the portfolio diversification theory is vital in explaining it. To paraphrase Agarwal (1980), the portfolio method of analyzing FDI has the major advantage of being applicable everywhere.

Multinational National Corporations are influenced by the decision of where to locate their foreign direct investment (FDI) (Barclay, 2000). FDI only applies to new, innovative products; it does not explain FDI in existing products already on the market [7]. The idea of internalization explains why multinational corporations (MNCs) have grown, and also sheds light on the reasons for FDI abroad (FDI). International business scholars Buckley and Casson (1976, 1985) say this approach has been prevalent for decades

in their work (Paul & Judy, 2002; Denisia, 2010). The idea focuses on intermediate inputs and technology to provide an additional explanation for FDI. One of the reasons multinational corporations exist is to maximize profitability by doing some transactions within the company rather than between entities. Also known as "internalization", this refers to the practice of reducing transaction costs while maintaining or even increasing profitability. Market imperfections are one factor for internalization.

Foreign direct investment (FDI) was previously the subject of research by Dunning (1976, 1993, 2000 & 2002). One of Dunning's innovations was the combination of two kinds of market imperfections required for FDI to take place, which was a breakthrough in the theory. One thing to keep in mind is that Duninng's theory relies on other theories. To the extent that it provides a framework, Dunning's theory contributes to our understanding of a wide range of different types of abroad activities, as well as the various climates in which they are launched. Examples of theories include those that examine FDI motivations, those that look at investment locations, and those that look at FDI as an internalization strategy. A blend of three different theories to explain FDI has been constructed by Dunning, and this is what Denisia (2010) calls a "eclectic theory" (I). As a result, economists came up with the OLI paradigm, often known as the eclectic theory of foreign direct investment. Theoretically, according to Dunning, these components address questions like how, why, and where.

Second, it has a large number of variables that have an impact on its accuracy in making predictions. The third complaint is that the distinctions between OLI and other concepts are blurred [8]. This theory discusses how a parent company can use the FDI growth in the country where a subsidiary has generated profit to fund the expansion of the subsidiary's FDI [9]. The ‘Barlow and Wender’ study shows that MNCs invest just a small portion of their resources in the beginning, with future expansions being funded by reinvesting profits made in the host country. According to internalization theory, a main incentive for multinational corporations to engage in FDI is so that they can take control of the vast majority of the manufacturing process. As a result, it implies that internal cash flows and investment expenditures have a positive connection, which is plausible given the reduced cost of internal financing. According to Froot and Stien, external funding is more expensive than internal financing because of capital market informational inadequacies [10].

1.1.1 The Kojima Theory

Direct investment, according to the Kojima hypothesis, is a method for transferring capital, technology, and management expertise from the country of origin to the country of destination. Resource, labor, and market orientation were highlighted by Kojima as the three most important drivers driving overseas investment by corporations. Kojima argued that foreign direct investment (FDI) was necessary to boost global markets' competitiveness and efficiency, as well as to improve industrial processes in countries with abundant natural resources. As contrast to the "international business approach" to FDI, this is a "macroeconomic approach" or a "factor endowment approach." Kojima divides foreign direct investment into two categories. Exports are in short supply and imports are in demand, therefore the initial trade terms generate an excess demand and an excess supply. This form of FDI improves the economies of the countries involved.

1.2 Empirical Review of Literature

1.2.1 FDI Activities in Previous Financial Crisis

According to Stoddard and Noy, FDI inflows tend to follow a pattern associated with financial crises, according to the research [11]. The research used Arellano-Bond GMM estimation with a country-panel regression technique. The research indicated a detrimental impact on the country's inward FDI. Poulsen and Hufbauer looked at FDI in times of crisis. FDI reactions to previous economic crises were compared in the study. They found that the present FDI recession is more severe than previous ones [12].

Takagi and Shi discovered that the Asian financial crisis had an impact on Japanese FDI by analyzing panel data on Japanese FDI flows to nine dynamic Asian nations between 1987 and 2008. Japanese FDI flows into Asia have decreased, according to Edgington and Hayter, who studied the sector's behavior of Japanese FDI in manufacturing. The total Japanese FDI volume remained stable during the Asian financial crisis, according to Edgington and Hayter (2001), who believed that the short-term reduction was only evident. Desai, et al. looked into how foreign companies react when the local currency depreciates dramatically without focusing on FDI. They discovered using US multinational data that a big devaluation causes foreign corporations to raise their own investment more than local enterprises [13].

Aguiar and Gopinath argued that infusion of foreign money in the form of M. & A. was equally consistent with the notion that liquidity constraint existed, according to the study conducted. Particularly in the crisis year, their empirical data reveal that the influence on the likelihood of being bought of liquidity (measured by cash flow, cash stock, and sales) changed considerably, "while high cash flow and sales in the non-crisis year implied a reduced acquisition probability. The loss in firm liquidity between 1996 and 1998, according to the authors, accounted for 25% of the observed increase in M &A activity in the tradable industries during that time period". The study by Alfaro, et al. examines how FDI's growth effects are linked to the health of the host country's domestic financial markets. Therefore, a post-crisis weakening of the banking sector means that a country's FDI gains will be lower. As a result, the amount of money coming in was reduced [14], [15].

Athukorala, (2003), reported that contrary to other kinds of capital inflows such as portfolio investment and foreign debt, FDI in the five crisis-affected countries (Thailand, Malaysia, Indonesia, Korea, & the Philippines) remained relatively constant during the crisis. However, exporters outpaced non-exporting domestic firms in sales, profitability and operational capacity during the crisis, according to Cheong [16]. According to the findings of the study, firms with more FDI had larger assets. When compared to other types of capital flows, FDI flows were constant throughout the financial crisis, according to research by Loungani and Razin and Kim and Hwang [17]. Lipsey also looked at FDI behavior during the 1982 Latin American currency crisis and found that FDI inflows to Latin America decreased during the crisis period, but remained positive throughout the study period [18], [19].

Graham and Wada came to a completely different conclusion about how external FDI behaved. As stated by the authors, as the overall FDI inflows to Mexico decreased slightly, FDI inflows from the United States were constant during the crisis. Urata, Japanese FDI to a number of Asian markets fell in the second half of 1997, according to Urata. Lipsey looked at the FDI in Mexico before and after the Mexican crisis of 1994, he found a significant shift. According to Lipsey, the volume of FDI in Mexico increased between 1992 and 1993, but fell by 15% during the crisis year of 1994. When FDI plummeted by 75% in the same time period, the author concluded that it was less volatile than portfolio investments [20], [21].

1.2.2 FDI Activities in Recent Financial Crisis

Odhiambo evaluated the impact of the crisis on FDI operations in selected SSA countries such as Botswana, Kenya, Malawi, and Mozambique was notably exception to this rule. The study used a panel data model method to evaluate OLS, Random Effects, and Maximum Likelihood Estimation to show contrary to expectations, the crisis had a positive influence on FDI inflows to SSA. This was due to FDI's concentration on natural resources in Mozambique and Botswana, as well as Kenya's and Malawi's weak integration into global markets. Guris, Sacildi, and Genc examined the effects of the 2008 financial crisis on determinants affecting FDI in countries with a high FDI rate. The study used a Panel Tobit model to examine the effects over the long term, and classical Tobit

models were estimated independently for each year to examine the effects before, after, and during the crisis. The analysis indicated that the crisis had no effect on this variable's impact on FDI [22].

Dorneana, Isan, and Oanea explored the influence of the recent global crisis on FDI in Central and Eastern European countries. They found financial crises have a detrimental impact on foreign direct investment (FDI). Vintila (2011) demonstrated that FDI inflows were significantly reduced and even responded faster to the crisis than other forms of capital flows when compared to past experiences of financial crises. According to the author, this shows that foreign direct investments (FDIs) are less reliable and more volatile when the global economy is unstable financially. Mamata investigated how the global financial crisis impacted FDI in the Indian real estate sector. Using secondary data obtained between 2002 and 2010, the study discovered that the crisis had a detrimental impact on India's housing sector development [23].

Ucal, et al. used a sample of developing nations in their empirical investigation. They used panel data from 148 developing countries between 1995 and 2007 to analyze the impact of the financial crisis on FDI inflows and concluded that the current financial crisis had a negative influence on FDI inflows. Alfaro and Chen focused on the impact of FDI in determining microeconomic performance. The study's findings suggest that international corporations performed better than domestic companies during the recent financial crisis, despite no significant differences being detected during normal periods [24].

UNCTAD reported that FDI inflows into developed and developing nations were different at the start of the crisis. Foreign direct investment (FDI) flowed into industrialized countries fell by 30% in 2008. As a result of this, developing countries have seen FDI inflows increase by 17% since 2007. Nevertheless, FDI fell in 2009 and onwards in both developed and developing countries. As a result of the investigation, the research was concluded that causes of such a global financial crisis, the decline in corporate profitability, the diminution of the stock market and a reduction in worldwide demand was due to rising credit costs that contributed to the collapse in global FDI. The UNCTAD carried out a study on the poll of global investment prospects in the current global financial crisis and found that it is an example of qualitative literature [25]. Following the financial crises, a recent survey found that multinational firms are becoming increasingly wary of foreign direct investment (FDI).

1.2.3 FDI Activities under Different Types of Financial Crises

Esho and Verhoef conducted a study on the effects of FDI, foreign aid and trade between 1990 and 2017. The study investigated the influence of FDI, trade and foreign aid on poverty reduction in 29 countries in Sub-Saharan Africa using a single model based on the feasible generalized least square (FGLS) technique. They found that FDI and foreign aid had a detrimental impact on poverty reduction in the nations investigated. The study also indicated that trade benefits in poverty reduction particularly in emerging nations. Joshua, Rotimi and Sardokie examined the impact of FDI on economic growth in 200 economies around the world between 1990 and 2018 in another related study. When estimating the panel's size, the researchers used approaches such as POLS, dynamic panel estimation, and the generalized method of moments (GMM). They found that FDI, debt stock and official development assistance contributed to economic growth in the nations studied in Sub-Saharan Africa. The study showed that FDI inflows are critical to the region's economic progress [26], [27], .

Joshua used an “autoregressive distributed lag (ARDL) approach” to examine the relationship between GDP, FDI, and government spending in the country of Nigeria. Empirical research found that FDI influx is crucial for economic advancement since it complements domestic resources. Buchana, Le, and Rishi investigated the effect of FDI levels and volatility on institutional quality. A panel data analysis of 164 nations from 1996 to 2006 indicated that FDI matters for strong institutional quality. The quality of the

institutions attracted FDI and that was important. Bogach and Noy looked at how FDI behaved to different sorts of financial crises and discovered that it differed greatly. Using a cross-country sample of 44 developing countries from 1987 to 2009, the authors discovered that financial crises have significantly negative influence on inward FDI. Banking crises, inflation crises, hyperinflation crises, and external debt crises have all been shown to impair the value of FDI inflows, including horizontal, vertical, and M&A FDI. According to the study, stock market crashes, currency crises, and local debt crises all had minor effects on FDI inflows.

Udoh and Egwaikhide bolstered the conclusion that exchange rate volatility and inflation uncertainty had a considerable negative impact on foreign direct investment (FDI) in Nigeria from 1970 to 2005. Ezirim and Muoghalu examined the exchange rate conditions and Nigeria's external debt influence on the country's investment burden. The study employed four foreign investment models to study the relationship between remittances of foreign investment income and variables such as currency rates and the burden of external debt on the international markets in light of international oil price fluctuations. The study found various results that external debt crises had a significant and positive impact in one hand, whereas currency crises and international oil prices had a significant and negative impact in the other [28], [29].

However, Soliman looked at how the currency crisis affected FDI activities in emerging markets. For the period 1966-2000, the author used an unbalanced panel of 48 developing nations to examine the sensitivity to currency crises in 21 emerging markets of three metrics of US external non-bank FDI (FDI stock, affiliate sales, and the number of affiliates). He found that currency crises did not have a negative impact on foreign direct investment (FDI) at these times. Blonigen [30], [31] investigated the effect of exchange rate fluctuations on currency crises. He predicted that FDI acquisition operations would involve the transfer of firm-specific assets including technology and managerial skills across markets, which may grow or fall in value and produce returns in currencies other than those used to purchase them. In Froot and Stein and Klein and Rosengren, currency crises can have quite a different impact than normal fluctuations in the exchange rate [30], [10], [31].

2. Materials and Methods

2.1 Theoretical Framework

The theoretical framework of this study is explored from three different perspectives. However, FDI is expressed as a function of cost-related factors (C), investment environment improving factors (E) and macro-economic uncertainty. This is functionally expressed as follows;

$FDI_{it} = f(C, E, M)$

2.2 Model Specification and Estimation Technique

In line with the theoretical framework and following the literature reviewed, the model for empirical estimation is specified linearly as;

$$FDI_{it} = f(LBC, INTR, INFL, EXR, MKZ, TOP, GDP, IFR) \quad (4.1)$$

Where,

LBC = cost related factors in this regard include labour cost (LBC),

INTR = cost of capital, using interest rate (INTR) as proxy,

INFL = domestic inflation (INFL) representing inflation rate and;

EXR = exchange rate (EXR). Other variables that measure investment environment factors in the specification are;

MKZ = Market size (MKZ) proxy for host country population,

TOP = trade openness (TOP), while;

GDP = represents economic growth and;

IFR = denotes infrastructure.

The functional form model specification in equation (4.1) can be re-specified in an estimable form as follows:

$$FDI_{it} = \alpha + \beta_1 lbc_{it} + \beta_2 \text{intr}_{it} + \beta_3 \text{infl}_{it} + \beta_4 exr_{it} + \beta_5 mkz_{it} + \beta_6 top_{it} + \beta_7 gdp_{it} + \beta_8 ifr_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (4.2)$$

Again, the FDI remain as earlier defined for instance measured as a ratio of GDP, labour Again, the FDI remain as earlier defined for instance measured as a ratio of GDP, labour cost (LBC) is measured as nominal GDP per hour of work, while log of interest rate (INTR) is a proxy for cost of capital. Others are inflation rate (INFL) measured as log of consumer price index and log of exchange rate (EXR) as a proxy for relative price. The market size (MKZ) is measured via the population growth of the host country expressed in percentage changes, while trade openness (TOP) is measured as the sum of export and import as a ratio of GDP. The level of economic growth and infrastructure (IFR) representing investment environment factors in the specification, were captured via log of GDP and the number of telephones per 1,000 inhabitants, respectively. More importantly, the term r represent each cross-sectional unit or FDI recipient country in SSA,t denotes time period, μ_i capture country specific effect, λ_t is specific effect, while ε_{it} is the error term.

To achieve the objective of this study which determines the capital flow that is more resilient to financial crisis between FDI and the other forms of foreign capital flow. The study introduced the subscript J in the specification as shown in equation (4.4) to denote different types of foreign capital flows, which in this case include foreign direct investment (FDI) and foreign portfolio investment (FPI).

$$FDI_{it}^{J} = \alpha + \beta_1 lbc_{it} + \beta_2 \text{intr}_{it} + \beta_3 \text{infl}_{it} + \beta_4 exr_{it} + \beta_5 mkz_{it} + \beta_6 top_{it} + \beta_7 gdp_{it} + \beta_8 ifr_{it} + \beta_9 D_1 + \beta_{10} D_2 + \mu_i + \lambda_t + \varepsilon_{it} \quad (4.4)$$

3. Results

3.1 Descriptive Statistical Analysis of the Research Data

The result of the descriptive statistics is presented in the table below;

Table 1. Descriptive Statistic.

Table 1A: Full –sample					
Variable	**No. Observation**	**Mean**	**STD**	**Minimum**	**Maximum**
FDI	858	3.128	6.972	-53.530	70.350
FPI	858	0.026	6.755	-88.880	116.600
Labour Cost (LBC)	858	30.480	22.650	4.884	85.840
Interest Rate (INTR)	858	17.170	10.750	4.737	113.300
Inflation (INFL)	858	68.840	42.530	0.014	342.200
Exchange Rate (EXR)	858	344.100	497.400	0.003	3,611
Market Size (MKZ)	858	2.575	1.090	-6.185	7.918
Trade Openness (TOP)	858	73.410	48.660	4.612	501.900
Growth (GDP)	858	29,377	75,448	240.100	464,282
Infrastructure (IFR)	858	26.590	39.850	0.000	162.000
Table 1(B): Pre –global financial crisis sample					
FDI	572	3.260	7.406	-53.534	70.355
FPI	572	-0.051	1.431	-5.769	11.615
Labour cost (LBC)	572	28.885	21.992	4.884	81.866
Interest Rate (INTR)	572	17.725	10.635	4.737	113.308
Inflation (INFL)	572	45.807	24.761	0.014	91.910

Exchange Rate (EXR)	572	278.189	362.631	0.003	2142.302
Market Size (MKZ)	572	2.589	1.228	-6.185	7.918
Trade Openness (TOP)	572	68.568	52.626	4.612	501.905
Growth (GDP)	572	22,343	55,293	240.10	340,238
Infrastructure (IFR)	572	3.510	9.260	0.000	80.345
Table 1(C): Post –global financial crisis sample					
FDI	286	2.865	6.013	-21.589	51.079
FPI	286	0.181	11.535	-88.878	116.568
Labour cost (LBC)	286	33.666	23.633	6.434	85.838
Interest Rate (INTR)	286	16.068	10.906	4.752	60.000
Inflation (INFL)	286	114.914	31.869	65.006	342.179
Exchange Rate (EXR)	286	476.004	674.094	0.935	3611.225
Market Size (MKZ)	286	2.547	0.744	0.069	4.183
Trade Openness (TOP)	286	83.097	37.800	31.229	242.983
Growth (GDP)	286	43,444	103,411	793.83	464,282
Infrastructure (IFR)	286	72.754	37.360	3.401	161.994

Note: STD denotes standard deviation.

As evident in the B & C parts of table 1, we further partitioned the sample into pre - GFC and post - GFC periods. We found the average inflow of FDI as a ratio of GDP to be 3.26% in the period before the global financial crisis compared to 2.86% during and after the GFC period. This portends that the average inflows of FDI into SSA for the period under consideration was relatively higher in the pre – GFC period compared to the post – GFC period. With respect to the FPI, the exact reverse was the case. More so, the standard deviation statistical value of 7.40% reveals FDI as relatively the most volatile in the pre – GFC period compared to the standard deviation statistic of 1.43% for FPI in the same period was the other way round in the post- GFC period, where the FDI was the least volatile compared to FPI. Again, the market size has the same minimum and maximum statistical values for both the full – sample and pre – GFC sample mainly reflect the fact that both the maximum and minimum values of the series in its current sample holds in the period before GFC.

3.2 Unit Root Test

The applicability of the dynamic heterogeneous panel data model as previously established was primarily influenced by the variable's likely non-stationarity. In that regard, we apply the traditional approach to modeling panel data with a large time series (T) dimension by subjecting the relevant variables, such as FDI, FPI, INTR, INFL, LBC, EXR, MKZ, TOP, GDP, and IFR, through a stationarity test. The current study analyzed four different types of panel unit root tests for the goal of robustness. Panel unit root tests with the null hypothesis of a common process, according to Tables 4.2a and 4.2b, imply panel unit root tests with the null hypothesis of a common process, respectively. While Im et al. and Maddala and Wu assume individual unit root processes in the second category, the null hypothesis in the third category assumes unit root with cross-section dependence. The fourth category, however, tests the null hypothesis of no unit root with a common unit root process (Hadri, 2000 Lagrange Multiplier test). Based on their individual hypotheses and test regressions, these tests have been classed as stationary (fourth type) or non-stationary (first, second, and third types). Starting with the two alternative measures of capital flows, the unit root test results show that both FDI and FPI are stationary at level thus exhibiting zero order of integration [I(0)] across the various unit root tests considered. The only exception to this regard was when the unit root test is IPS and only for the case of FPI. As regards the independent variables, the unit root test results appear mixed across variables and test methods. For LBC and MKZ for example, the former is stationary but only when LLC is the test method and the stationarity on the other hand, holds for the

latter when the test methods are ADF Fisher. The series are however, reported to have exhibited higher order of integration for instance I(1) when the unit root test method are Breitung, HT rho, IPS and Hadri Z statistic.

For economic growth (GDP), infrastructure (IFR) and trade openness (TOP), the different unit root tests seem consistent in their report of these variables as of higher order of integration I(1). The outcome of the stationarity test is however, mixed for independent variables such as interest rate (INTR), exchange rate (EXR) and inflation (INFL), with some of the tests pronouncing some of these latter variables as stationary exhibiting level order of integration I(0) and some higher order of integration I(1). All these findings as documented in Tables 2A and 2B reveal the stationarity status of the series as mixed across the different tests under consideration, but mainly hovered around I(0) and I(1) orders of co-integration. This, among others further validates the appropriateness of panel-ARDL model, which allows for the combination of variables of different order of integration in the same modelling framework as the preferred estimation framework in the context of this study.

Most macroeconomic variables change due to economic activity disruptions. To avoid erroneous analysis, data are tested for stationarity. Levin, Lin, and Chu (LLC) and (Im, Pesaran, & Shin, (2002) (IP&S) (IPS)). The results as presented in Tables 1A to 1C indicate a mixed order of integration for all the regions under investigation.

Panel Unit Root Tests Results

Table 2a. Null Hypothesis: Unit Root with common process (LEVIN, LIN & CHU, 2002) LLC. Result for Levin, Lin & Chu (2002) LLC unit root test.

Variables	T-Statistic	1% Critical Value	5% Critical Value	10% Critical Value	**P/Value**	Order Of Integration
DFDI	-22.7601	-14.545			0.0000	1(0)
DFPI	-8.5936		-1.663		0.0481	1(0)
DLBC	-21.4941	-13.746			0.0000	1(0)
DMKZ	-16.4524	-13.554			0.0000	1(0)
DGDP	-16.9485	-8.889			0.0000	1(1)
DINTR	-8.5867	-3.101			0.0010	1(0)
DEXR	-7.2710	-4.373			0.0000	1(0)
DINFL	-7.7507	-6.764			0.0000	1(0)
DTOP	-20.3416	-11.855			0.0000	1(1)
DIFR	-11.8555		-1.721		0.0000	1(1)

Source: Author's computation from STATA 13.0 estimation result

Table 2b Null Hypothesis: Unit Root with individual unit root process, Augmented Dickey Fuller (ADF) Fisher unit root test.

Variables	T-Statistic	1% Critical Value	5% Critical Value	10% Critical Value	**P/Value**	Order Of Integration
DFDI	-3.422	-3.608			0.0004	1(0)
DFPI	-7.8877	-6.317			0.0000	1(1)
DLBC	-3.2649	-3.195			0.0007	1(1)
DMKZ	-4.8817	-4.633			0.0000	1(0)
DGDP	-2.6345	-2.626			0.0047	1(1)
DINTR	-5.2551	-5.301			0.0000	1(1)
DEXR	-3.9792	-3.908			0.0001	1(0)
DINFL	-3.5211	-3.501			0.0003	1(1)
DTOP	-2.1472		-2.250		0.0168	1(1)
DIFR	-3.5014		-2.226		0.0003	1(1)

Source: Author's computation from STATA 13.0 estimation result

Short and long Run Results for Baseline Model Estimation

Table 3. Empirical Estimates from Baseline.

	Mean Group (MG) Estimator		Pool Mean Group (PMG) Estimator	
	Coefficient	**Standard Error**	**Coefficient**	**Standard Error**
Long-Run Estimates				
LBC	-0.0409	0.0371	-1.1921**	-0.3234
MKZ	-2.0942*	0.1103	-0.5060	0.1557
GDP	1.1370	0.0308	0.9140***	0.0084
INTR	4.8446	5.9561	0.5060	0.5495
EXR	0.2229	2.8695	0.6711	0.5362
INFL	9.2792	5.6944	0.0994	0.5753
IFR	0.1356	0.0903	0.0178**	0.0049
TOP	0.2286**	0.0871	0.0578**	0.0019
Short-Run Estimates				
Constant	18.8159***	6.5899	31.8524***	2.6202
ΔLBC	-0.9339	0.9859	-0.7351**	0.3172
ΔMKZ	3.8307	2.4879	0.7896	7.9837
ΔGDP	4.6511	4.0236	1.4827	1.8918
$\Delta INTR$	4.6573	10.7015	1.2052	5.4938
ΔEXR	-2.7839	5.4000	1.4248	2.7018
$\Delta INFL$	-0.3949	11.3089	1.0858	8.1336
ΔIFR	0.2353	0.1530	0.7536**	0.1479
ΔTOP	-0.1063	.1860	0.0580**	0.0192
ECM	-0.3597***	0.0071	-0.1579***	0.0056
Hausman test $-\chi_k^2$	2.8800 (0.9414)			

Standard errors are indicated and level of significance are such that *** p<0.01, ** p<0.05, * p<0.1

Results of Model with Traditional Determinants of Inflows of FDI

Table 3 present the empirical results obtained from the estimation of the study's baseline model in equation (4.3) using Mean Group (MG) and Pooled Mean Group (PMG) panel estimation techniques. To determine which is the more appropriate estimator between MG and PMG, the study began by using Hausman test whose result was 2.8800 as coefficient and 0.9414 as the standard error showing an insignificant relationship as an indication that the Hausman test result supports the non-rejection of the null hypothesis of the PMG as the more appropriate estimator as against MG which is the alternative. Even though the empirical results in Table 3 included estimates from both the MG and PMG, this study focused its discussion and analysis on the implication of the empirical finding based mainly on empirical estimates obtained using PMG. Thus, we focus on interpreting and analyzing the results based on PMG as being established as the more appropriate estimator as determined using the Hausman test.

Starting with the Error Correction Model (ECM), the negative coefficient of -0.1579 and positive standard error of 0.0056 shows both negative and significant relationship, thus supporting the potential of long run relationship between the FDI and its various determinants being considered. This also implies the reversibility of FDI to equilibrium adjustment state of 16% per unit of time after a shock to it in the long-run. The Labour Cost (LBC) captures the impacts on FDI in Sub-Saharan African Countries. With respect to coefficient elasticities, a 1% increase in the labour cost (LBC) has the potential of reducing the inflow of FDI by 0.73% and 1.19% in both the short run and long run respectively, given the negative sign on the coefficients at 5% level of significance. This negative relationship

conforms to the a priori theoretical expectation of the study. The economic theory has it that LBC should adversely relate with the inflow of FDI in SSA, that is, a decrease in the LBC will improve the FDI inflow in SSA countries. This portends in the economic theory that high cost of labour in SSA is likely to constitute an adverse effect on the inflows of FDI. This result is consistent with the findings from previous studies such as Alavinasab, (2013), Okafor et al. (2015), Mfinanga, (2018).

Market Size (MKZ) which is proxy to Population growth has a positive coefficient of 0.7896 in the short run and a negative coefficient of -0.5060 in the long run and both are insignificant. This is to say that the study found the coefficient on the market size (MKZ) to be positive in the short run and negative in the long run situations and both are not statistically significant. It is expected that MKZ should have a positive and significant relationship with FDI inflows in SSA. But the empirical result is testifying that what encourages the inflow of FDI is not just the size of a country but the economic strength of the economy either in terms of Per Capita Income (PCI) of the populace or the growth of the economy in terms of GDP. This assertion can be confirmed by the positive and significant relationship of the GDP in the long run as reported in table 3.

The result of GDP in the long run has a positive coefficient of 0.9140 and significant relationship with FDI in selected SSA countries. This conforms to the a priori theoretical literature which states that GDP of the host countries matters a lot for the inflow of FDI. However, the coefficient of GDP is not only positive but statistically significant such that 1% increase in the level of economy (GDP) has the potential of increasing the inflow of FDI by 91%. This result is consistent with previous empirical studies (Hejazi, 2009; Medvedev, 2012; Kahouli and Kadhraoui, 2012), which confirmed that the GDP of the host countries matter for the inflow of FDI. It can also be inferred that the inflow of FDI is not just about the size of a country but the economic strength either in terms of per capita income of the populace or the growth of the economy in terms of GDP. More so, the empirical result of interest rate (INTR) at both short run and long run are positive and insignificant respectively. It is expected that high interest rate will discourage FDI inflows while a low interest rate will encourage FDI inflows in SSA. But, the estimated result of this study shows a positive and statistical insignificant relationship with FDI inflows to SSA.

The same also applies to Exchange rate (EXR) where the estimated result shows a positive and insignificant relationship at both short run and long run estimates. The a priori expectation has it that while the currency of a country appreciates, the level of FDI is expected to decrease, conversely, if the currency of a host country depreciates, the level of FDI is expected to increase, that is, an inverse relationship between EXR and FDI inflows. But the empirical result of EXR is positive and insignificant meaning that it makes no impact in the FDI inflows in SSA. Inflation (INFL) is also expected to have an inverse and significant relationship with FDI inflows. But the present empirical result of INFL is positive and insignificant. This portends that INFL makes no impact in the inflows of FDI in SSA.

Another factor of FDI is trade openness (TOP). TOP, according to economic theory, invites international capital, or more precisely, FDI, to the host country, but it can also reduce competition between foreign and home enterprises. In other words, it is projected to be related to FDI inflows in a beneficial way. In selected SSA countries, this TOP coefficient is positive with values of 0.580 and 0.0578, respectively, and significant at the 5% level of significance in both short and long run conditions. This means that a 1% increase in trade openness will likely result in a 0.05 percent rise in FDI inflow in the short and long run, respectively.

According to the empirical literature, infrastructure (IFR) encompasses a wide range of aspects, including roads, ports, trains, and telecommunications networks, as well as institutional development (eg. accounting, legal service, etc). It is supposed to boost FDI flows into a country by increasing the productivity potential of investments in the country.

In selected SSA nations, the empirical result coefficient of IFR is positive, with values of 0.7536 and 0.0178 in the short and long term, respectively, and significant at the 5% level of significance. This means that a 1% increase in infrastructure has the potential to enhance FDI inflows by 0.75 percent and 0.01 percent in the short and long run, respectively. This shows that infrastructure plays an important role in international trade, boosting FDI inflows to some SSA nations.

Table 4. Empirical Estimates from model with the role Global Financial Crisis. Standard errors are indicated and level of significance are such that *** p<0.01, ** p<0.05, * p<0.1.

	Foreign Direct Investment (FDI)		**Foreign Portfolio Investment (FPI)**	
	Coefficient	**Standard Error**	**Coefficient**	**Standard Error**
Long-Run Estimates				
LBC	-0.0453**	0.0194	0.2460	1.1442
MKZ	0.3850	0.1310	0.6118**	0.2444
GDP	1.7260***	0.5680	0.9515***	0.2317
INTR	-0.0300	0.5250	0.0102**	0.0045
EXR	1.1930**	0.5370	0.7147*	0.3272
INFL	-0.5560**	0.1020	-1.0600**	0.8002
IFR	0.0484**	0.0061	0.6224**	0.2020
TOP	-0.0024	0.0037	0.5144	1.0123
Short-Run Estimates				
Constant	20.3400***	1.9490	21.009***	11.229
GFC	-0.4302**	0.0126	-0.8782***	0.2122
ΔLBC	0.3160	0.6890	0.0111***	0.0009
ΔMKZ	0.8380**	0.3560	2.9211	2.9942
ΔGDP	1.6201	1.3401	0.1442	2.0101
$\Delta INTR$	1.2770	5.3300	-0.8881**	0.4213
ΔEXR	2.2300	2.6040	2.1102	1.9980
$\Delta INFL$	0.4290	6.5870	-0.0466**	0.0111
ΔIFR	0.0747**	0.0100	0.2811	0.7221
ΔTOP	0.0565**	0.0219	0.6121***	0.0166
ECM	-0.1731***	0.0368	-0.5011***	0.1921

Results of Model with the Role of Global Financial Crisis in the Inflows of FDI

So far, the authors have empirically investigated the inflows of FDI to SSA without taken cognizance of the GFC. Thus, the focus of this sub-section is to understand the extent to which the inflow of FDI is affected by 2007-2008 global financial crisis. Thus, presented in Table 4 is the empirical results obtained from the estimation of the model that accounts for the role of global financial crisis in the investigation of FDI inflows to SSA. Similar to our earlier finding, the ECM results in both the FDI and FPI models that controls for global financial crisis are negative and significant, which is an indication that the evidence of equilibrium and long run relationship between the independent variables namely, FDI and FPI and their respective determinants. To this end, the coefficient elasticities would be considered for both the short and long run situations

4. Discussion

To determine whether the FDI is potentially more resilient to the GFC compared to other forms of foreign capital flows, the study compared the impact of the recent global financial crisis on FDI as against its impact on FPI [31]. Using the constant dummy variable approach, the impact of GFC on FPI was obtained as the (C + GFC) which is (21.009 + (-0.878)) and equal to 20.131 in the short run estimates. Therefore, this shows that the average inflow of FPI to SSA decline by 0.88% compared to 0.430% as earlier established in the case

of FDI in the short run. This evidence of relatively lower decline in the inflow of FDI compared to the declining in FPI further reaffirms the findings of the previous studies on the resilience of FDI to global financial crisis when compared to other forms of foreign capital flows such as FPI. Particularly similar to the finding of this present study is the study by Hill and Jongwanich.

5. Conclusion

This study concludes that foreign direct investment (FDI) is significantly more resilient than foreign portfolio investment (FPI) inflows to SSA. The study empirically examined whether FDI inflow to SSA is significantly more resilient than other capital flows such as foreign portfolio investment (FPI) inflows in the (2007-2008) global financial crisis in the short run situation from 1985 to 2017. Haven shown that the variables under consideration are characterized with mixed order of integration, the study explore a non-stationarity and heterogeneity panel data estimators capable of accounting for such mixed order of integration as well as heterogeneity often associated with panel data with large time series dimension. Empirically, the study found that of all the traditional determinants of the inflows of FDI, labour costs, economic growth, infrastructure and the openness of trade are consistently the most significant variables for explaining the dynamics of FDI in SSA relative to other factors such as interest rate, exchange rate and inflation nonetheless the period before, during or after the financial crisis.

Recommendations

Haven ascertained the importance of foreign direct investment in Sub-Sahara Africa (SSA), this study recommends the policies that may stabilize growth of FDI inflows, such as allowing free license of operation, maintaining exchange rate stability, improving the business climate, and guaranteeing strong/stable macroeconomic performance. Thus, more foreign investors should be attracted, and trust in current ones would rise, which should increase investment opportunities and growth in the region. Therefore, greater attention should be given to FDI whenever global financial crisis is experienced.

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