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DETERMINANTS OF FOREIGN DIRECT

INVESTMENT INTO SUB-SAHARAN AFRICA:

A Panel Data Analysis (1990-2016)

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Graduate School of International Studies

Seoul National University

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Determinants of Foreign Direct Investment Into Sub-Saharan Africa:
A Panel Data Analysis (1990-2016)

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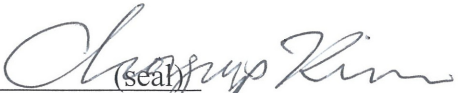International Area Studies Major

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추상

이 연구는 SSA 회원국의 외국인 직접 투자의 주요 결정 요인을 규명하는 것을 다룬다. 이 연구는 국가들이 각국뿐만 아니라 지역 차원에서 더 민감한 요소를 식별해야하는 FDI 를 더 많이 끌어 들이기를 고려합니다. 따라서 FDI의 주요 결정 요인을 확인하는 것은 정책 입안자에게 중요한 과제이다. 다른 개발 도상국과 비교할 때, 사하라 사막 이남 아 프리카에 대한 FDI 유입은 매우 낮다. 본 연구는 외국인 직접 투자 (Foreign Direct Investment, FDI)의 유치에있어 공식 개발 원조와 내륙 영향의 역할을 탐구한다. 어떤 방 법이 우리의 데이터와 일치하는지 시험 한 후 연구는 1990 년에서 2016 년까지 SSA 44 개국의 추정치에 고정 효과 모델을 적용하고 토지를 더미 효과로 보는 간단한 OLS 추정 법을 적용했다. 평가 결과에 따르면 시장 규모, 기반 시설, 개방성, 사적 및 정치적 안정 성 및 인플레이션에 대한 국내 신용은이 지역의 외국인 직접 투자 유치의 주요 결정 요 인이다. 그 결과는 또한 ODA와 인프라와의 상호 작용과 정치적 안정성을 보여주는 ODA 가 SSA 국가들로의 FDI 유입에 상당한 영향을 미친다는 것을 보여준다. 게다가 국가들은 인프라 개발 및 정치적 안정을 개선해야한다. 이는 ODA가 FDI를 더 많이 끌 이 연구는 SSA 회원국의 외국인 직접 투자의 주요 결정 요인을 규명하는 것을 다룬다. 이 연구는 국가들이 각국뿐만 아니라 지역 차원에서 더 민감한 요소를 식별해야하는 FDI를 더 많이 끌어 들이기를 고려합니다. 따라서 FDI의 주요 결정 요인을 확인하는 것은 정책 입안자 에게 중요한 과제이다. 다른 개발 도상국과 비교할 때, 사하라 사막 이남 아프리카에 대 한 FDI 유입은 매우 낮다. 본 연구는 외국인 직접 투자 (Foreign Direct Investment, FDI) 의 유치에있어 공식 개발 원조와 내륙 영향의 역할을 탐구한다. 어떤 방법이 우리의 데 이터와 일치하는지 시험 한 후 연구는 1990 년에서 2016 년까지 SSA 44 개국의 추정치 에 고정 효과 모델을 적용하고 토지를 더미 효과로 보는 간단한 OLS 추정법을 적용했다. 평가 결과에 따르면 시장 규모, 기반 시설, 개방성, 사적 및 정치적 안정성 및 인플레이 션에 대한 국내 신용은이 지역의 외국인 직접 투자 유치의 주요 결정 요인이다. 그 결과 는 또한 ODA와 인프라와의 상호 작용과 정치적 안정성을 보여주는 ODA가 SSA 국가들 로의 FDI 유입에 상당한 영향을 미친다는 것을 보여준다. 게다가 국가들은 인프라 개발 및 정치적 안정을 개선해야한다. 이는 ODA가 FDI를 더 많이 끌

Abstract

This study deals with to find out the main determinants of FDI in SSA countries. The studies consider countries to attract more FDI they should identify which factors are more sensitive for each countries as well as regional level. Therefore identifying the key determinants of FDI is a crucial task for policy makers. Compared to other developing countries, FDI inflow in to sub-Sahara Africa is very low, beside this study explores the role of Official Development Assistance and the landlocked effect in the attraction of Foreign Direct Investment (FDI). The study after testing which method is consistent with our data, fixed effect model is applied for the estimation of 44 SSA countries from the period 1990 to 2016 and simple OLS estimation method also applied to cheek the land looked dummy effect. The estimation results shows that Market size, Infrastructure, openness, Domestic credit to private and political stability and inflation are the key determinant in the attraction of FDI in this region. The results also show the interaction of ODA with infrastructure and ODA with political stability also has a significant effect of FDI inflow in to SSA countries. Besides, countries should also improve infrastructural development and political stabilities, as this strengthens the effectiveness of ODA in to attracting more FDI.

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TABLE OF CONTENT

ABBREVIATIONS AND ACRONYMS

FDI **:** Foreign Direct Investment

LDCs : list developing countries

LLDC : Landlocked Developing countries

MNCs : multinational corporations

ODA : Official development Assistance

OECD : Organization of Economic Cooperation and Development

SSA : Sub-Sharan Africa

WDI **:** World Development Indicators

LIST OF TABLES

ALLENDIX

LIST OF FIGURES

ACKNOWLEDGEMENTS

This journey so far has been a wonderful experience. The most important thing to Remember in this journey is the faithfulness of God upon my life irrespective of my Shortcomings. Thank you Jesus you have been so good to me.

*"**Thank You Lord**
I come before you today
And there's just one thing that I want to say
Thank You Lord
Thank You Lord
For all you've given to me
For all the blessings I cannot see
Thank You Lord
Thank You Lord*

*With a grateful heart
With a song of praise
With an outstretched arm
I will bless your name
Thank You Lord
I just wanna thank You Lord
Thank You Lord
I just wanna thank You Lord
Thank You Lord
For all you've done in my life
You took my darkness and gave me your light
Thank You Lord
Thank You Lord"*   (BY Don Moen)

Thank you ALL!!!

CHAPTER ONE: INTRODUCTION

1.1   Background of the study

Before 1980s, less developing countries of Latin America, Asia and Africa were dependent on the borrowing from European Commercial Banks and Official Development Assistance to finance their development. But, after the debt crisis that happened at the beginning of 1980s, Western European Banks were reluctant to renew the credit they were extending to LDCs. The reduced flow of credit from foreign commercial banks was further compounded by a long-term stagnancy in the flow of ODA. In response to the reduced flow of these sources, LDCs started to implement economic reforms to attract FDI as an alternative means to their economic growth.   The response of FDI to the reforms was very high in Latin American and some Asian countries. For instance, Mexico and Chile succeeded in attracting FDI after the first half of the 1980s.Their success was attributed to the macroeconomic adjustments that improved their economic performances. These adjustments involved stabilization, liberalization of trade, restricting and privatization of public enterprises. For the newly industrialized Asian countries, it was their success in avoiding high inflation and external debt that enabled them to attract high level of FDI inflows. In addition to this, they maintained skilled and cost efficient labor force or human capital along with the liberalization of the investment regime (Husain and Jun, 1992).

China is also a country that succeeded in attracting FDI beginning from the end of 1970s. Its FDI inflow was growing continuously as a result of a whole set of effective policies adopted by the Chinese government throughout the post reform period. These policies include the formulation of legal framework for FDI, the establishment of specifically designated open coastal areas for FDI and the adoption of various

financial and foreign exchange policies. Moreover, infrastructural improvement and provision of obstacle removing incentives to FDI have created strong institutional and locational advantages necessary to attract massive FDI.

Due to the high level of inflows into these countries, the share of FDI received by the countries of Asia was increasing; while that of Latin American countries was falling continuously due to the relatively unstable political environment caused by the debt problem. As different from early 1980s, however, the amount of FDI inflows into the two developing regions increased the total inflows to the developing countries from US$14.7 billion in 1982 to US$ 51.5 billion in 1992, and further increased to US$ 172.5 billion in 1998. However, much of the FDI inflow went to Asia and Latin America, while the share of Africa was very low, accounting only an average of 6.2% of the total FDI inflows to LDCs between 1989 and 1998. In value terms this was only about US $ 5 billion in 1989 and US $ 7.9 billion in 1998; and the trend of the share of Africa in the total inflows into LDCs over the period 1982-1998 was decreasing (from 8.4% for the period 1989-1992 to 4.5% for 1993-1998)(UNCTAD, 1999c). However, after 1990s, FDI became a vital incentive of economic growth and development. In addition countries which are opened they don't have sufficient capital for investment due to poor saving.

 In recent years, many of developing countries have applied various economic reforms in order to achieve higher economic growth. One of the main major was opening up and liberalization of the economy. Following basic policy reform, FDI inflow in to developing countries has been increase dramatically. However, "these inflows have been unevenly distributed among developing countries, with Asian countries received the biggest share of FDI inflows, compared to African countries. Among the African countries, the southern region which consists of SACU member countries has received 55 percent more FDI than other regions in Africa. Northern, Middle, Western and Eastern Africa have received 22 percent, 10 percent, 9 percent and 4 percent, respectively, of the FDI share in Africa "(UNCTAD, 2010). Lack of competitiveness in factors markets, relatively unstable macroeconomic and political

environment contributed to the declining share of the SSA countries. This result lead to raises the question of of "why FDI inflows are quite uneven among the developing countries, and why African region are only able to attract relatively smaller share of the total FDI flowing to developing countries as a whole and in particular SSA."

1.2   Statement of the Problem

FDI could help African in many ways. First, it's cover finical the development gaps by filling the resource gaps as advocated in the traditional neo-classical neo- classical analysis of determinants of economic growth.   FDI is one form of the flow of foreign saving which is typically account a form of   filling gaps between the availability of domestic saving target level of investment that is required to achieve a certain target growth. Second, it plays positive role in filling the foreign exchange gap for these countries, which are dependent on primary export items to earn foreign exchange currency. FDI inflow also not only cover the part of deficit in current account balance of payment but also help to remove overtime deficit., if the foreign owned enterprise can generate a net positive flow of export. Third, by collecting taxes and other public revenues from these foreign firms, the government can mobilize public finance resource required for development project financing. Finally, it advances managerial skill and knowledge, productivity capacity and efficiency.

Several theoretical and empirical studies have been showed on the determinants of FDI on the developing countries. Earlier studies have accentuated abundant determinants that have influenced FDI inflow into developing countries, which includes   "the level of human capital; institutional quality, rule of law, market size, the quality of infrastructures, macroeconomic stability, availability of natural resources, labour cost, wage and political instability". Later, in this study also some of the factors would be integrated to examine the impact on FDI inflow in to SSA

countries. Moreover this study would focus on two more additional factors which are ODA and landlocked effect on the follow of FDI in to SSA land locked countries.

As compared to the other world SSA countries are received very low, the question is why SSA receive very low FDI inflow? What are the features that affect the flow of FDI in to SSA countries? What measures have to be taken to change this situation?" To find out the answer of that question's it's vital to find out which factors are the most significant.

1.3   Objective of the study

The principal objectives of the study are:-

➢   To test determinates of FDI inflows into SSA countries during the last two and half decades, by employing time series (panel) data.

➢ To find out the impact of foreign Official development assistance flow of SSA countries

➢ To identify the geographical disadvantage as hosts for FDI

The specific objectives are to detect:

(1) The specific objective of the study are   effects of economic factors like domestic market availability, natural resource endowment, domestic credit availability, infrastructure, Labor force participation rate on FDI inflows and macroeconomic factors that are sources of uncertainty & instability:, inflation, and foreign debt on FDI inflows;

(2) land lock effect of FDI inflows into SSA countries.

(3) The impact of ODA on FDI inflow of the SSA countries

1.4   Research question

1. What are the determinants of FDI in SSA?
2. What is the role of Official development assistance in enhancing FDI inflows in to SSA countries?   .
3. SSA countries which are having access to sea have a comparative advantage in the attractiveness of FDI than the landlocked countries?
4. Among all determinants of FDI what make SSA countries more attractive as a Destination for FDI?

1.5   Significance of the Study

As discussed in the background section, many theoretical and empirical studies have been lead on the determinants of FDI by using both panel and time serious data in SSA countries However, the outcomes are still questionable on which factors exactly determine FDI inflow. Beside other determinants of FDI in this study we will examine the indirect effect of ODA for the attractiveness of FDI inflow in to Sub-Saharan African countries and the geographical effect the host country on FDI inflow in to SSA countries

1.6   Scope and Organization of the study

The study follows the approach of examining the pull factor determinants of FDI i.e., those factors which are persistent in the host country. The research considers ODA and landlocked dummy as a significant variable.

5

The study is organized as follows. The second chapter is concerned with Overview of foreign direct investment, Determinants of the attraction of FDI in to SSA countries, the nexus between FDI and foreign aid and foreign aid to SSA .The third chapter reviews both theoretical and empirical literatures on the determinants of FDI inflows to FDI. In chapter four, Methodologies, Data sources and description and models will be discussed. In Chapter five the analysis of both the descriptive data and regression results and finally, summary and policy recommendations are given in the sixth chapter

CHAPTER TWO: OVERVIEW OF SUB-SAHARAN AFRICA

2.1 Introduction

Sub-Saharan Africa is part of Africa content in the south of Sahara desert. It is one territory with 48 countries. It is very diverse in its historical, political, cultural and environmental contexts. "The region covers 21.2 million square kilometers, which is characterized by desert with little vegetation in the Northern part; tropical forests in Central Africa; a wet and hot tropical climate found mostly in West and Central Africa; and a dry and cool highland climate in the Eastern plateau. The Democratic Republic of Congo (2.2 million km2) is the largest country and Sao Tome and Principe is the smallest country it covers around 1000 million km2. Nigeria has the highest population (168 million) and Seychelles the lowest (85,000). 11.8% of the world's population lived in Sub-Saharan Africa in 2010 and with an estimated population growth rate of 2.7% it is the region with the fastest population growth rate in the world" (UNESCO ,2016).

Prior to 1880, some areas of the region were under European coloniser. However, except South Africa, Liberia and Ethiopia all African countries was divided up and traded among various European powers after the Berlin conference of 1884-1885, including "Spain, Germany, Britain, Italy, Portugal, France and Belgium. By 1957, decolonisation has begun and in the 1960s only South Africa seemed not to be set for the recovery stage since it is yet to gain independence" (Gopal and Tyler, 2010). In 1960 when most of Africa countries attained independence, the economy was expected to bring positive outcome nevertheless, decades later, the region is confronted with the highest regional poverty rate (Tyler and Gopal, 2010).

The region is remaining   a challenge for the government as well as for international organizations. "Hence, a much needed economic reform and social programme is

required. However, most of these economic reforms and social programmes in the region seem to be ineffective "(Njoupouogingni and Ndambendia ,2010). "As often argued, for the region to sustain growth, it must not just embark on reforms but also improve its investment climate, enhance infrastructure and protect property rights "(Ndulu, 2006). This chapter covers FDI into Sub-Saharan Africa and this will focus more on inflows; the nexus between FDI and foreign aid, ODA to SSA Countries.

2.2 Foreign direct investment to SSA countries

FDI play a energetic role Foreign Direct Investment (FDI) plays a vital role in this global world "as an engine of employment, technological development, productivity enhancement, economic intensification, and more importantly, as an instrument of technology transfer, especially from developed to developing countries" (Jensen, 2003). "Nowadays it can be seen that there are flows of goods, services, capital, technologies and people increasingly permeating the world trade "(European Commission, 2002). Predominantly in developing countries, which referred as "low-income and middle-income economies" Natural resource, are the main driver of FDI in to most Africa countries.

After 2007-2008 financial crises between the period 2010 to 2014, FDI inflow in to Africa increased by 22% it was the period for high growth rate and macroeconomic and political stability for the Continent. In this period most of FDI were linked with extractive, notably in "Algeria and Egypt in North Africa, Ghana and Nigeria in West Africa, Chad and the Republic of the Congo (Congo) in Central Africa, and Angola, Mozambique and South Africa in Southern Africa "(KPMG, 2016a). However, after the end of commodities price boom it was obstructed on GDP growth and extractive investment across Africa. It was the reason for FDI volatility at that period.

FDI inflow in to Africa somehow recovered in 2016 due to the improvement of diversification of investment in manufacturing, services and infrastructure. "saw the share of coal, gas and oil over total FDI in Africa shrink to 14% from 24% in 2015 and 36% in 2014. This reduction in investment of 19% (from USD 15.8 billion in 2015 to USD 12.9 billion in 2016) has been more than compensated by increased investment in construction (+300%), manufacturing (+40%), transport (+300%), electricity, and information and communication technology (ICT)" (FDI Markets, 2017).

While countries with mineral resource remain the major destination for FDI flows in 2015 and the flow increase in to non-resources rich countries. "Based on announced greenfield projects in 2016, the top ten African destination countries for FDI were Egypt, Morocco, Angola, Ghana, Mozambique, Ethiopia, South Africa, Nigeria, Tanzania and Kenya, in that order" (FDI market 2017). "These ten countries accounted for 92% of announced foreign capital investment in the continent for 2016" (FDI market,2017).

Figure 1.1 1 Foreign direct investment to Africa, resource-rich vs. non-resource-rich countries, 2005-16
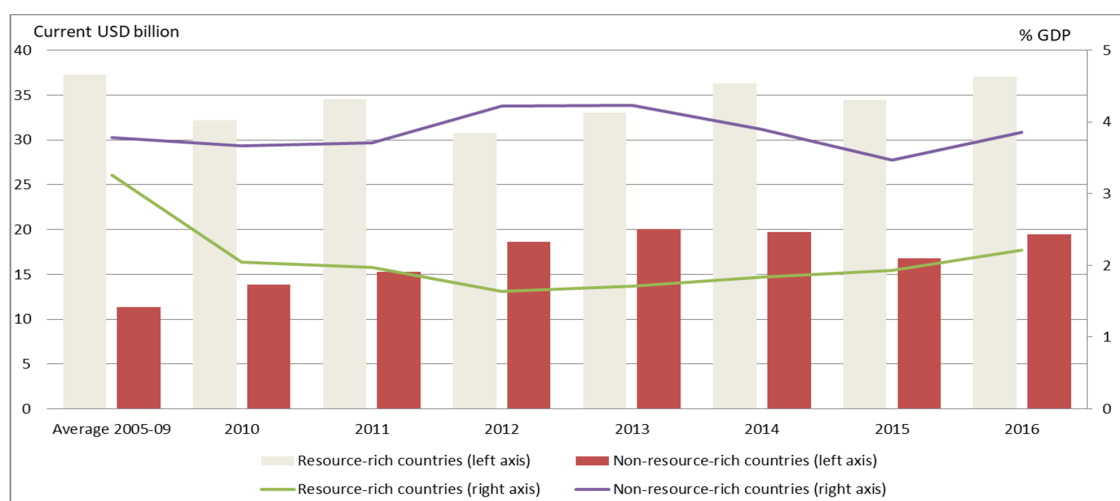
Sources: Adapted from IMF (2016a) and UNCTAD (2016c).

Since early 1990s, FDI inflow in to SSA countries reach 42 billion us$ in 2015. In the last 35 years the continent share remains 4%.in global level since 2003 the share of SSA is 2 to 3 %, to find where was the region account for more than 6% we have to go back to 1970s.Compared to many other emerging economies SSA is lost a ground in the flow of FDI. "Even as the region saw a 218 percent increase in FDI during the 1980s and 1990s, Latin America registered a growth of 560 percent, South Asia of 789 per cent, East Asia of 990 per cent, and the developing countries as a whole of 760 per cent over the same period "(Asiedu 2004).

In the last 25 years the region couldn't attract more than 10% of FDI flow to developing countries. Some of the reason behind this gap are less infrastructures, economic instability and human capital shortage and other administration factors and low applicability of new reform   (Cotton and Ramachandran 2001). "The recent efforts by some countries in sub-Saharan Africa to put in place new policies to attract FDI have not always been successful and often the impact of these policies remains minimal when compared to other developing countries" (Asiedu 2004). "The countries which have been more successful in turning around their FDI fortunes have been those, such as Mozambique, Tanzania, or Zambia, where modest privatization policies and significant advantages in the rule of law and the protection of private property have been achieved "(Jenkins and Thomas 2002).

"FDI directed towards sub-Saharan Africa is concentrated in only a few countries. In 2015, the four principal recipients of FDI –Angola (US$8,681 million), Mozambique (US$3,711 million), Ghana (US$3,192 million) and Nigeria (US$3,064 million) – alone attracted 43 per cent of all FDI channeled to sub-Saharan Africa". "In the same year, four countries together held 52 per cent of the region's total FDI stocks: South Africa (US$124,940 million), Nigeria (US$89,735 million), Mozambique(US$28,768 million), and Ghana (US$26,397 million)". (UNCTAD 2015)

Figure 1.2 1 FDI inflows, by region and economy, 1990-2016 (Millions of dollars)
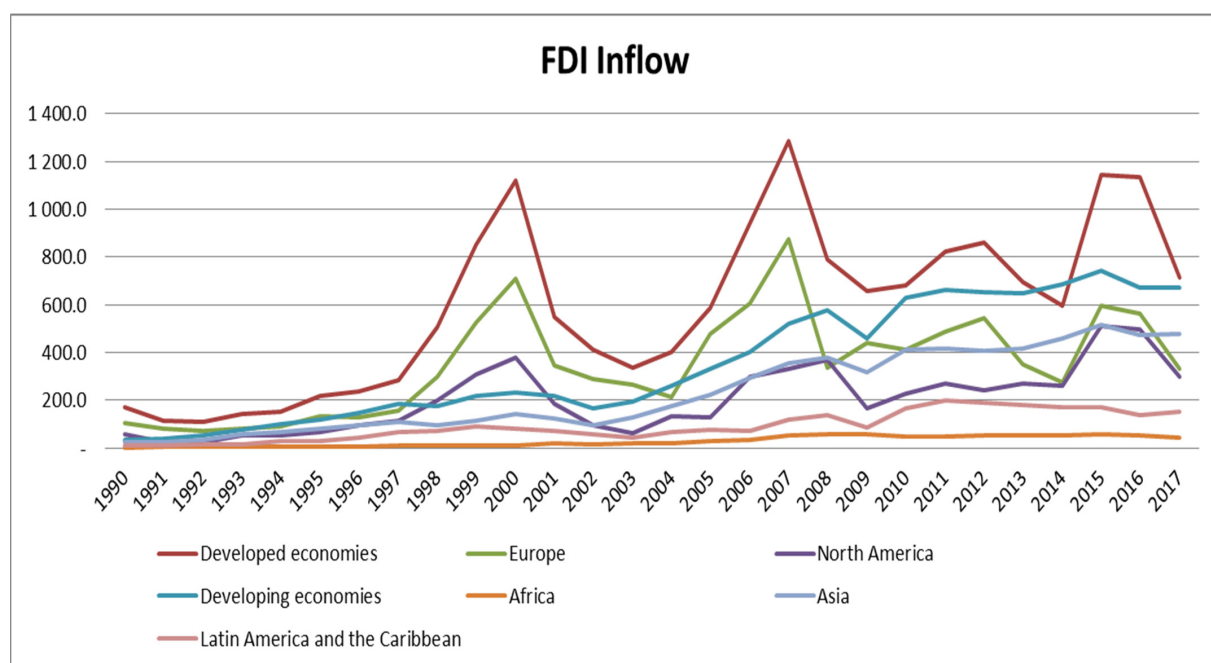
Total FDI inflow in percent of GDP to SSA between the period 1985 to 2015 is avalebl in Figure 1.3, "The growth in 2016 is mainly caused by the surge in investment in Angola, which reported a 352 per cent increase and is considered to be the largest FDI recipient among less developed countries "(UNCTAD, 2016). "On the contrary, countries in Central Africa and West Africa had to deal with declining FDI, primarily due to low commodity prices, which continue to depress investments "(UNCTAD, 2016). "FDI towards these economies is mainly driven by the presence of natural resources and thus vulnerable to commodity price developments" (Asiedu, 2006). "The importance of commodity prices is indicated by the fact that the primary sector (i.e. mining, quarrying, and petroleum) is the second largest source of inward FDI, comprising 35% in 2012 (Figure 2). This suggests that FDI in SSA is primarily driven by an endowment component, and that countries facing a lack of natural resources, will attract very little or zero FDI" (Asiedu, 2006). "In order to reduce the

11

vulnerability to commodity price developments, countries are reviewing current policies aimed at removing high barriers on FDI. For example by allowing 100 per cent foreign ownership of a given company in order to attract an increase in FDI"(UNCTAD, 2016). "Another reason why FDI is neglected in SSA is because MNEs prefer to locate in countries large enough to implement economies of scale required for production "(Treviño & Mixon, 2004). "It is believed that FDI encourages economic development since it generates spillovers through the transfer of knowledge, technology, and management skills" (Cleeve, 2008). However, "countries should be aware that some estimated benefits might be difficult to realize and vary depending on host country and condition. For example, if the host country suffers from weak economic development or when FDI leads to adverse economic and political effects. Supposed economic effects include lower employment, diminished competition in domestic markets, balance of payments deficits, and in potential, detrimental environment effects caused by FDI "(Kurtishi-Kastrati, 2013). "In spite of poor economic conditions in the region, growing infrastructural development, urban consumer markets and promising trade agreements, all are significantly attracted FDI inflows in a number of African countries" (UNCTAD, 2016).

Figure 1.3 1 Foreign direct investment, net inflows (% of GDP) between 1985-2015
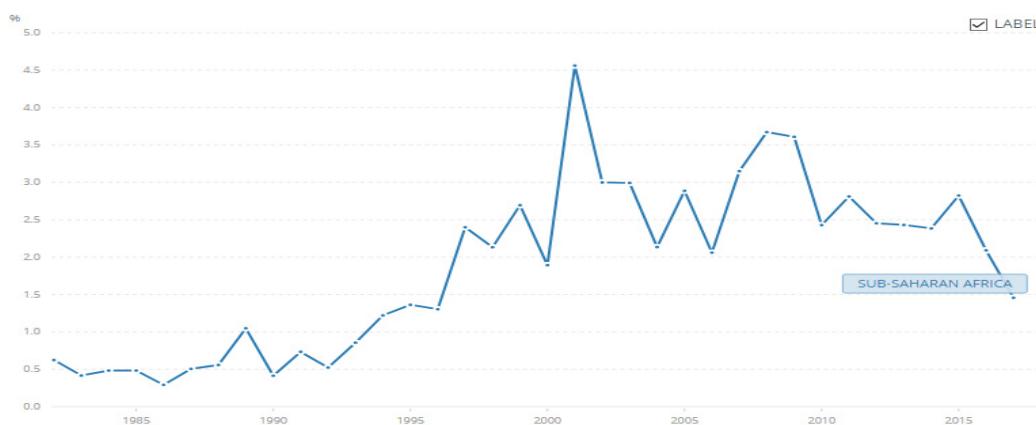
Source: World Bank 2018

12

2.3 What determines the attraction of FDI in sub-Saharan Africa?

There are numerous features explain the geographical absorption of FDI in convinced countries of sub-Saharan Africa and not in others. "The following two have been the factors which have drawn the greatest attention as the drivers of FDI in sub-Saharan Africa: the role of market size on the one hand, and the presence of natural resources, on the other (Asiedu 2006). The main driving reasons for the four largest FDI recipients of SSA countries are large oil and mineral reserves. In average export of some countries like Angola and Nigeria. Similarly, in 2015 among six groups, three of exports were dominated by commodities, controlled more than 30 percent of FDI stocks in SSA. "Of the other 70 per cent, South Africa accounted for 24 per cent, leaving less than half of FDI stocks for the remaining sub-Saharan countries. Besides, continental two biggest economies of Nigeria and South Africa With a GDP of US$ 486 billion and US$314 billion respectively in 2015, natural resources probably do not constitute the only or principal reason that would explain their privileged position in the FDI ranking. Although Nigeria is a large producer of oil and South Africa possesses large reserves of gold and platinum, it covers more than a quarter of its exports in 2015" (WTO 2017). "Including Angola comes a very distant third (US$102 billion), followed by Sudan (US$97 billion) the economy of those four countries represented 63 percent of sub-Saharan Africa's 2015 GDP, with Nigeria alone accounting for 30 per cent. In that year, the rest of 44 countries shared the remaining 37 per cent, of which only twenty had a GDP greater thanUS$10 billion "(World Bank 2017).

However natural resources and local market are not the only factors of FDI inflow. Natural resources and local markets. Numerous studies have observed the role of other factors on flows of FDI in SSA. (Jenkins and Thomas2002; Basu and Srinivasan 2002; Asiedu 2006). different privatization policies undertaken by African states, and macroeconomic and political stability are considered to play a non-negligible role as well as Colonial links also affect the flow of FDI in to SSA countries. "The presence

of sound monetary and fiscal policies, adequate exchange rate policies, and support for the development of the private sector send strong positive signals to investors. In addition, openness to international trade, the level of human capital, macroeconomic and political stability, corruption (or lack of it), and the quality of infrastructure have, among others, been mentioned as other potential factors driving FDI" (Bende-Nabende 2002;). However, some of the countries in SSA can claim to competitive in any of the area with emerging states in Asia and Latin America.

2.4 The nexus between FDI and foreign aid

. According to Kimura and To-do (2010) "foreign aid promotes FDI inflows from the same aid donors to the recipient nation because the provision of foreign aid send signals on the recipient's business environment to the donor country firms thus making it easy for donor firms to invest". The buffer effect is investigated by Carro and Larru (2010) and they find that "foreign aid acts a buffer against volatile FDI in Brazil, implying that the allocation of foreign aid by donors is driven in part by considerations of periods of low FDI inflows into the country." The infrastructure and rent seeking outcome of foreign aid on FDI is discussed by Harms and Lutz (2006), they argued that "the infrastructure effect is positive through improved recipient country infrastructure which all tie in to raising the marginal productivity of capital and encouraging FDI inflows. The rent seeking effect is negative due to the actions of private firms in competing for aid rents may result in a decline in the marginal product of capital of the recipient, causing a decline in FDI inflows." Bhavan et al. (2011) argue that "foreign aid for human capital and infrastructure development enables improvements in not only physical infrastructure but also enables increased knowledge allows for improved production methods and output and in turn encourages investors in the improved markets. They found foreign aid for human capital and infrastructure development to be complementary to FDI inflows, while there was no evidence of a crowding out effect of foreign aid for physical capital on FDI inflows."

Figure 1.4 1: **SSA region: Net ODA received (% of GNI)**
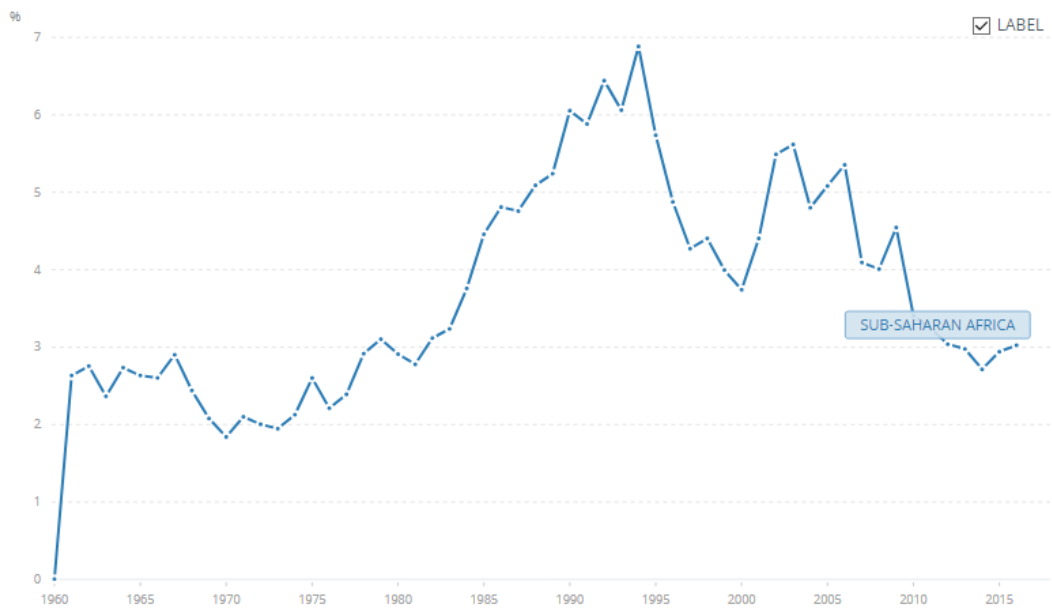
CHAPTER THREE: REVIEW OF THE LITERATURE

3.1 Introductions

. Many scholars have been conducted on the determinants of FDI, deal with difference spaces. They have used various methods, countries and period and variables in investigative the factors that determine FDI. However, most of the findings are mostly questionable. A fundamental theories of FDI have been developed by prominent scholars, such as Hymer's (1978) industrialization theory, theory of the product cycle Vernon's (1966), Dunning's eclectic paradigm theory(1973; 1980) , internationalization theory (Rugman's 1981), knowledge and capital theory (Markusen's1997)   and dynamic comparative advantage (Kojima's 1973)

The two theories which were most prominently discussed are grounded on "neoclassical trade theory and internalization theory". The first, presented in the 1960s, was constructed up on the key dispute of the Heckscher-Ohlin (HO) trade model to clarify the motives behind investors who operate production chains abroad, but export products back to their home country. The theory argues that, because of heterogeneity in countries' endowments, there exist incentives for foreign firms to transfer their abundant production factor to where the returns on the factor are higher. Thus, with these incentives, foreign firms will keep locating factories in different countries until factor prices are equalized.

The other main stream theory, internalization theory, which was introduced by Buckley and Casson in 1976, also examines the motivation behind FDI. Instead of outsourcing different parts of the production process, this theory points to the fact that internalizing these processes is likely the effective way for MNEs to benefit from a foreign market due to lower transaction costs. A noticeable example is when a

foreign firm owns an innovative technology, internalizing the production chain in the market is the best way to get or maximize profit on the new market. This way help farm to minimize the risk that their technology is stolen and expect higher profits because of lower transaction costs.

In 1992, Dunning combined those two theories in to his own form of OLI paradigm, a seminal framework that has been widely used as the foundation for empirically examining the factors of FDI inflow. This chapter reviews the theatrical and empirical studies on the determinants of FDI.

FDI definition

According to IMF FDI is defined as:

"*An incorporated or unincorporated enterprise in which a foreign investor owns 10 per cent or more of the ordinary shares or voting power of an incorporated enterprise or the equivalent of an unincorporated enterprise.*" ((Ridgeway)

In other words, "Foreign Direct Investment involves a multinational enterprise (MNE)

acquiring capital assets into a company/firm/enterprise located in a country that differs from the origin of the investor. In case the level of ownership is at least 10 per cent of ordinary shares, investors are authorized management and voting rights "(OECD, 2009)

"FDI could occur in two different forms. If the investment includes the establishment of an entirely new operation in a country different from origin, it is indicated as greenfield investment, while if the investment concerns merger and acquisitions with existing firms in a foreign company it is known as cross border mergers and acquisitions" (OECD, 2009).

3.2 Theoretical Literature Review

3.2.1 Eclectic Theory of Foreign Direct Investment

The OLI paradigm is one of the powerful and strong fundamental frame works to examining appropriate theories of FDI (Dunning, 2001). The OLI paradigm consists of 3 sub paradigms from which one can analyze the reasons why firms engage in FDI: ownership (O), location (L), and internalization (I). Based on the eclectic theory, According to Dunning (1988), "the next three must be met before a firm engages in FDI. "First, the firm must have an ownership specific asset, thereby giving it an advantage over other firms and is exclusive to the firm". Second,"the firm must internalize these assets within the firm instead of contracting, selling, leasing or licensing". Third, "there must be an advantage in setting up production abroad rather than relying on exports". (Dunning, 2001; Masahiko, 1991; Brewer, 1993;). "Without these conditions, the foreign markets are best served exclusively through exports" (Lim, 2001). The first sub paradigm (Ownership), which is more or less related to the argument derived from the HO model, explains that specific competitive advantages of foreign firms are one of the motives behind foreign investment. These advantages range from technological advantages to specific expertise and managerial skills, which enable foreign firms to operate profitably in the host country despite not being a local company. The particular advantages of ownership are entirely controlled by firms. This include access to factor input quality of management and access to technological "These might include the access to factor inputs and product market, quality of management and access to technological capabilities such as economics of learning, innovation activities and access to financial capital, firm size, and multinational experience, patents and trademarks" (Faeth, 2009; Dunning,).

The second sub paradigm (location) explains that investment abroad provides MNEs with some immobile advantages specific to the host countries, such as cheap domestic labor, natural resources, and favorable regulations. Location choose not only depend on production it's also on the purpose or the ole of the investment plus

whether it's progressive project or new (Dunning, 1998).the incentives to attract MNEs are vary based on the nature of seekers Incentives if it's market seeking, natural-resource seeking, or efficiency seeking. (Chung and Alcacer, 2002 ;). To realize the case for example export oriented investors are not much influenced by market size than import substituting investment.

Expectations of The MNEs expectation toward the location-advantage assets toward that improve inference to the competitive advantages which enabled them to consistent in to more knowledge intensive activity.

Some of the studies indicate that "MNEs are increasingly seeking locations that offer the best economic and institutional facilities in order to fully maximize the firms' competencies "(Dunning, 1998). The study of Mody and Wheeler (1992), examined that location arrangements of US MNEs presented that degree of industrialization, quality of infrastructure, and existing levels of FDI are more significant than other indicators. However, even if they are adequate to make the most of the full rents of FDI the result indicate that ownership and location advantage has also impact on FDI. In order to take full advantage of such condition, Dunning O and L should be supplemented by internalization

Internalization, the last division mostly influenced by internalization theory of Buckley and Casson's, points out the benefit of overseas investment from acquiring companies to internalize the production process of intermediate goods. Moreover this paradigm argues that the benefit of involve in FDI to produce intermediate goods is higher than that of granting the right to local firms, MNEs are the one to stay in involving these activities. When firms diced to produce internally, the advantages of specific internalization issues also arise in the meantime. This implies how maximize the gains from ownership advantages overwhelmed market imperfections. Hence, "the above paradigm indicate the reasons why firms looking oversee investment, what the necessary condition, where they invest and the reason behind the prefer FDI than other means of Market interaction or possible forms of foreign market entry" (Dunning, 2001). Nevertheless, the theory has been criticized

for pay no attention to another aspect of FDI theory concerning the importance of the OLI paradigm to empathetic FDI, which suggests that FDI is a dynamic process. Combining the different aspects of these paradigms, Dunning categorizes the incentives of investors into three types, market seeking, resource seeking, and efficiency seeking.

3.2.2 Resource Seeking

"The availability of natural resources in host countries motivates resource seeking FDI and traditionally this is seen as the most important host country determinant of FDI" (Nunnenkamp, 2002). This means that This means that most resources rich countries are attracted more asset seeking firms, which are interested on exploiting and securing natural resources especially physical infrastructure and row material, such as power, telecommunication, and transport network (Sauvant, 2008;). Otherwise, this could be the recipient countries advantage through minimizing cost by obtaining expensive resource, low quality, immobile or not accessible in the home market (Brouthers et al, 2008; Kalyvas and Webster, 2011;). FDI activities manly determaine by the type of FDI in developing countries particularly natural resource rich countries (Kalyvas and Webster, 2011). Nevertheless, through time this type of FDI has constantly diminished following the deacres the world output share of natural resources account and is no longer the favored mode of securing natural resources such as oil and minerals (Nunnenkamp, 2002). "FDI took precedence over other forms of international business in resource rich countries because they lacked the huge capital needed for resource extraction or were devoid of the necessary skills/know-how. Joint ventures, non-equity arrangements with foreign investors and arm's length trade relations are gradually not common when host countries

20

possess the required capital and technical skills, thus giving rise to competitive enterprises" (Nunnenkamp, 2002;Kudina and Jakubiak, 2008). "Nevertheless, as maintained by Seyoum (2011) without considering the roles of institutions in the determinants of FDI, only the accessibility of skilled workforce, stable physical infrastructure and natural resources are not enough to determine FDI inflows". On the other hand biased natural resources, resource seeking investors considered labor force and trade openness. Such kinds of investors prefer export oriented countries for their FDI destination, and mainly seek out countries with exportable resources and an open trade policy to either export their resources back to the investors' home country or to engage in the regional market.

3.2.3   Market Seeking FDI

Market seeking investment grounded seeking new clientele's. This type of investor is concerned in engaging in the new market or introducing new merchandise, particularly where their market authority and profit can be take full advantage of the opportunity. Thus, market seeking FDI is frequently directed towards import substituting host countries. To overwhelmed import barriers, these investors establish plants and produce their product inside the receiver country's borders. This kind of engagement enables the investors to have access to the local market directly, with local production and distribution. penetrating markets out of home countries at the cost of exporting are always the main objective for market seeking investors (Wadhwa and Sudhakara, 2011; Brouthers et al, 2008). "It shares the advantageous opportunities presented by per capita income growth, market size and market structure of domestic market and consumer preferences in the recipient country "(Sauvant, 2008;Kudina and Jakubiak, 2008;). Moreover, it is even more beneficial to market seeking investors when the host country also prepared them for

location advantages, such as a cheap labor force, to facilitate their production process. Market seeking investors are thus highly concerned with both the production resources and potential consumer base of their host countries.

Also, "market seeking FDI is motivated by local/regional markets. The idea behind investing in a host country can be to avoid regulations, tariffs or other barriers or to save operational costs. One example is, Japanese FDI in automobiles in the US during the 1980s" (Kudina and Jakubiak, 2008;Sauvant, 2008; Kinoshita and Campos, 2002;). It's called "tariff jumping investment" (Kalyvas and Webster, 2011). However, besides the trade market size and restrictions, firms has a possibility to engage in market seeking investment "once their main suppliers, competitors and customers have set up foreign producing facilities. Thus, they follow them abroad to maintain and strengthen their market share, develop or explore new markets or retain their businesses "(Franco et al, 2010).

3.2.3 Efficiency Seeking FDI

Known also as "off shoring", this is encouraged by provide new bases of attractiveness for firms and arrange for entry into areas where costs of production are lower than other. Commonly, it means that lower labor costs can be reflected a locational advantage for attracting foreign investors. "One example is, a credit card or mobile company establishing call centres in India to serve customers in the UK or US "(Kalyvas and Webster, 2011; Wadhwa and Sudhakara, 2011). "The efficiency seeking FDI is mainly undertaken by service, manufacturing and distribution multinationals from countries with high labour costs" (Sauvant, 2008) "that establish operations in countries with lower real labour costs to supply labour intensive intermediate or final products. However, in order to attract such investments, recipient countries have endorsed policies towards free trade" (Kudina and Jakubiak,

2008). Under the circumstance that a market is already well established in the host country, efficiency seeking investors who possess highly efficient production processes can still make a profitable investment abroad by taking advantage of economies of specialization and scope across value chains. These investors look for advanced human capital, stable governments, and quality infrastructure as indispensable preconditions for the attraction of investment. As new markets become difficult to establish, oversee investment gradually shifts towards the efficiency seeking type.

3.3 Empirical Literature Review

Since the introduction of Dunning's OLI framework, several empirical studies have been commenced to investigate the determinants of FDI, especially in the case of developing countries. Besides, the three advantages to get better FDI destination, highlighted by Dunning, earlier studies have been motivated on additional factors like exchange rate, country size, labour cost and political factors, including government effectiveness, corruption and political instability. Some studies have also accentuated other factors like the role of trade policy, tax policy, and foreign investment policy in amplifying FDI inflow to host country. As well as   by Using the stimulation equation approach, Tsai (1994) examine the factors affect FDI by including variables such as economic growth, market size, , trade balance and wage rate., the estimation reveals that economic growth and market size are positively related to FDI inflow.

In the study of Morisset (2000), the determinants of FDI estimated by using cross-sectional and panel analysis. The study conducted with 29 Sub-Saharan countries for

the period 1990–1997. The independent variables were illiteracy rate, GDP growth, trade, infrastructure and urban population ratio. The outcomes show that economic growth and trade has a positive and significant effect on FDI inflow inversely infrastructure, Illiteracy rate and urban to population ratio, are negatively affect FDI flow. In his study the author stressed to show Africa countries can effectively attract FDI inflow even without the accessibility of large market size and natural resources.

  Onyeiwu and Shrestha (2004) by using 29 African countries panel data examined institutional and macroeconomic effect on FDI through applied both fixed and random effects models over the period 1975–1999. "The independent variables included in the model were, inflation, economic growth, trade openness, natural resource availability, interest rate, international reserves, external debt, wisdom, taxes, infrastructure and political rights". The results suggested that "openness, economic growth, inflation, international reserves and natural resources are important determinants of FDI. Political rights and Infrastructure, however, not show significant relationship with FDI inflow to Africa. Associated to the previous studies," Yasin (2005) added official development assistance (ODAs) as endogenous variable in analyzing of 11 Sub Saharan African countries for the period 1990–2003. The outcomes display that bilateral ODA, labour force, trade openness, exchange rates and growth rate have a positive and significant impact on FDI flows and multilateral development assistance, GDP per capita growth rate , political freedom and civil liberties and country risk level are insignificant. The findings show that most FDI inflow to SSA countries are more resources and probably efficiency seeking.

Similarly, in the study of Asiedu (2006) "employed panel estimation for 22 countries over the period 1984–2000 to analyses the influence of political instability, market size, legal system, inflation, and infrastructure and education level on FDI flows". The results come up with market size, natural resources, good infrastructure, higher education, lower inflation, population rate, trade openness, political stability, a reliable legal system and lower corruption attract more FDI inflows. The author

recommended that even if countries has a shortage of natural resources   and with small market size could still attract FDI by improving the institutional quality and policy environment. In a recent study, Sridharan, Vijayakumar and Rao (2010) did similar study for BRICs countries from the period 1975–2007. They examine that labour cost; market size, infrastructure, gross capital formation and currency value were the main determinant of FDI inflows for BRICs countries, while the result show trade and Macroeconomic stablity are insignificant. Furthermore, Wadhwa and Reddy (2011) inspected the factors affect FDI inflow in to 10 Asian countries based on three motive of FDI which are resource seeking factors (including infrastructure and imports), efficiency seeking factors (including Macroeconomic stability) and market-seeking factors (including population growth   and economic growth). The estimation concludes that "all these factors positively affect FDI inflow into the selected Asian countries. on the other study , Ismail (2009) observed that market size of the host and source countries, short distance, common language, border and extended market relative to distance attract more MNCs of ASEAN countries". The study it was adopted semi-gravity model and other factors like inflation rate exchange rare and effective government budget allocation are among other important factors that attract FDI. Moreover, economic and social factors such as infrastructures and non-economic factors such as trade policy and transparency also motive foreign direct investors to ASEAN region.

  In a current study, Jadhav (2012) categorized economic, political and institutional factors and adopt on BRICS countries as sample. The multiple regression founding shows "rule of law, trade openness, market size, voice and accountability are positively affect FDI in flow and on the other hand the natural resource has a negative effect on FDI inflow". In his conclusion the author argued that nature of FDI flows to BRICS countries are of efficiency seeking and market seeking. The study for All SSA countries also provide similar outcomes

Zeng et. al. (2001) and Asiedu (2002) argue that determinants of FDI inflow in to SSA countries are different from other regions. Moreover the policy measurement of

other regions also may not accurately work for SSA regions. The study finds that indeed the drivers of FDI in to SSA are different than other regions. Precisely, while and advanced capital return and infrastructure development drive FDI in to non-SSA countries, but these factors are not significant in case of have SSA. In addition, Asiedu (2004) finds infrastructure, market size, skilled labour force, political and macroeconomic stability are all influence FDI inflows to the region.

In the study of 29 SSA countries Suliman and Mollick (2009) find that "political and civil rights, literacy rate and the incidence of war are fundamental in FDI decisions of firms. Bhathattachrya, Montiel and Sharma (1997) also found that for 15 SSA countries in the period 1980-1995, trade openness, market size and the variability of the real exchange rate were significant in attracting FDI inflows".

The study about resource endowment effect for the attraction of FDI in to SSA countries, he found that different result particularly in SSA countries For example, (Asiedu 2002;) find that natural resource rich SSA countries receive more extractive FDI, however Asiedu (2013) experiments similar study and found natural resource curse in oil-rich SSA countries magnifies corruption and political instability and thus discourages FDI inflows.

As we see from different evidence from many studies that abundant factors influence FDI inflows into recipient countries. However, many studies carried out in the developing countries there is no a specific factors consistently affecting FDI inflow. "The results are mixed from one to other empirical studies so we can't pike specific factors for the determinants of FDI in to all SSA countries. The empirical review established that the importance of each of these factors varies across regions, countries, time and methodology. In this regard, studies pertaining to the African region or group of countries specifically belonging to economic alliances in the African region are very few "(Irandoust, 2010 and Ericsson). Thus, the recent studies intend to supplement the existing literature by examining the factors that affect FDI inflow.

CHAPTER FOUR: DATA AND METHODOLOGY

4.1 Theoretical Framework

4.1.1 Model specification

The aim of this paper is to identify the determinants of FDI inflow in to SSA countries. following both theoretical and empirical framework of Greene (2003) , Gujarati and Porter (2009) and Baltagi (2001). "Panel data is now widely used to estimate econometric models owing to its advantages in quantitative studies" (Bond, 2002).

"Panel data refers to the pooling of observations on a cross-section of countries, firms, households, etc. over numerous time periods" (Baltagi,2005). "It has a double subscript on its variables which are space (cross-section) and time dimensions. When the cross-section units are more than the temporal unit (N>T), the panel data is known as cross-sectional dominant". "On the other hand, when the temporal units are more than the spatial units (N<T), the panel data is known as temporal dominant" (Podesta, 2000). "Panel data regression model has space as well as time dimensions so panel data is the combination of cross-section and time series data" (Gujarati and Porter 2009). The model can be specified as follows:

$$LFDI_{it} = a + \beta 1 LODA + \beta 2 LMAR_{it} + \beta 3 LTRD_{it} + \beta 4 LINF_{it} + \beta 5 LDCP_{it} + \beta 6 LINFR_{it} + \beta 7 LLABF_{it} + \beta 8 LNAT_{it} + \beta 11 LALD + \varepsilon_{it}$$

LFDI_{it} = "log of net inflow of FDI in current US$ to the ratio of GDP for country

i at time t".

LODA= "log of Official Development Assistance in percentage of GNI"

  LMARit = "market size (log of GDP of country i at time t")

LTRDit = "trade openness (the sum of export and import to the ratio of GDP for each country i at time t").

LINFit = "inflation rate (annual percentage as proxy of economic stability in country i at time t")

LINFRit = "infrastructure (number of main telephone lines per 1000 people in a country i at time t").

LDCP="Domestic credit to private sector (% of GDP)"

LLABF= "Labor force participation rate, total (% of total population ages 15+) (national estimate)"

LNATit = "natural resource (mining produced in each country i at time t)"

LALD= land locked countries dummy

εit = the error term

4.1.2 **Variables Descriptions**

(a)   Five years   lag of ODA

  ODA plays an vital role by covering the financial gap for development, particularly in countries which are attract less FDI. We be aware of that a large amount of   ODA and other financing resources will be compulsory if developing countries are to attain the development goals.in this study take the five year lag of ODA's share (%) in the country's gross national income (GNI) as independent variable, to recognize the long run relation among FDI and ODA. This study considers More ODA attract more FDI in flow in to SSA countries.

(b) Market size

One of the key determinants of FDI is Market size, most of studies used it. "Investors are normally attracted to countries where market size is large compared to countries with low market size. So, the higher the market size, the higher the investment flow." (Yasin; 2005, Razafimahefa et al. 2005,

(b) Trade openness (TRD)

Openness indicates the movement of output and capital of the country. "The countries that implement relatively restricted trade policies will eventually discourage FDI inflow compared with those countries that practices free trade policies. Trade openness is represented by the ratio of export plus import divided by GDP. Trade openness is expected to have a positive impact towards FDI ". (Wafure et al., 2010;)

(c) Macroeconomic stability (INF)

Macroeconomic stability is one the main requirement to receipt more FDI, specifically when interest of foreign investors is worried. "Unstable economic environment, which is characterized by high inflation and interest rates will raise the cost of investment and affect the return of FDI in a negative way" (De Mello, 1997). "On the other hand, lower inflation would results in higher FDI inflows '(Aseidu, 2006; and Ismail, 2006). As a result, inflation rate is used as a representation for macroeconomic stability".

(d) Infrastructure (INFR)

One of the key factors of FDI inflow in to host countries are infrastructures Infrastructure is one of the important factors that could affect FDI inflow. Particularly, in to developing countries that could influence the flow of FDI into the host country. "A country that is well equipped with infrastructures such as airports, water supply, power supply, roads, telephone, and internet would be able to minimize the cost of doing business for the investors and allow them to maximize the rate of return on their investments"(Asiedu, 2002 and 2004). For the resolution of the present study, the access to electricity per 1000 people will use as the representation for infrastructure.

(e) Domestic credit to private sector (DCP)

"As the structure of FDI shifts from natural resources to efficiency seeking incentives, the role of financial development becomes more important for several reasons. Once efficiency seeking investors determine the inefficient market they want to engage in, their construction of production facilities requires financial guarantees. As a result, efficiency seeking investors would prefer a freer and more developed financial market to diminish financial risk" (Gouidar & Nouira, 2014). Domestic credit to private sector refers to financial resources provided for private sector by host countries.

(f) Labor force participation rate (LABF)

Because of the lower wage, access to Labor force is one of the main factors that attracts foreign investors into most African countries. "Lower labour costs would decrease the production cost and maximize the profit, making the country desirable for most investors. This eventually would result in a higher inflow of FDI" (Yasin,

2005; Vijayakumar, 2010; Rajan et al., 2011). For this study avaleblity of labor force measured using the number of population between 15 to 65old

(g) Natural resources (NAT)

In the previous studies FDI inflow in to most African countries are resources seeking. Therefore, the availability of abandon natural resources attracts more FDI. For this study the "natural resources rents (as share of GDP)" is adapted to measure the effect of Natural resources. "The total resources rents of a country include the sum of oil, coal (hard and soft), forest, mineral, and natural gas" (World Bank).

(h) land locked countries dummy

The impact of sea-based connections in assisting countries in to global economic linkages and benefit from the comparative advantage, access to see is vital. These studies contain 15 landlocked SSA countries as dummy variables to examine landlocked effect of FDI inflow.

(i) First lag of inward foreign direct investment stock (% of GDP)

It will be included as an explanatory variable in the model, in order to grasp the impact of previous investment. Singh and Jun (1995) point out that the presence of the lagged FDI variable will enable us, on the one hand to account for possible autocorrelations of errors, and, on the other hand, to indirectly capture the effect of factors omitted from the model but which may have negatively influenced FDI in the past. Busse and Hefeker (2005) agree on the idea that taking into account the lagged FDI solves the time series problem of autocorrelations, but they expect a positive effect since foreign investors are more attracted by countries receiving already considerable foreign investments

(j) Political stability

Political instability is a common problem in Africa. Therefore countries which have relatively political stabilities, they will have advantage on attracting more FDI. So, countries rank of political stability and absence of violence adopt as measure for political stability for this study.

4.1.3 Data

This study conducted a data for 44 Sub-Sahara African countries between the year 1990 to 2016. The data consist time series for each countries and cross-sectional for a given each year. All the data have been collected from "World Development Indicators (WDI)" data base. List of countries has been indicated in Appendix 1 and Table 1 arrange for a summary of the variables used in the estimation model.

Table 4.1: variables Summary and Expected sign

Variable	Description	Source	Expected sign
FDI	Foreign direct investment, net inflows (% of GDP)	WDI	
ODA	Net ODA received (% of GNI)	WDI	
GDP	GDP (current US$)	WDI	+
Trade openness	Trade (% of GDP)	WDI	+
Macroeconomic stability	Inflation, GDP deflator (annual %)	WDI	_
Infrastructure	Access to electricity (% of population)	WDI	+
Financial Development	Domestic credit to private sector (% of GDP)	WDI	+
Labor force	Population ages 15-64 (% of total)	WDI	+
Natural resources	Total natural resources rents (% of GDP)	WDI	+
ODA_l5	five years lag of Net ODA received (% of GNI)	CREATED	+

FDI_L1	first lag of FDI	CREATED	+
FDI_L5	five years lag of FDI	CREATED	+
Dummy Variable	land locked countries dummy	WDI	-

4.2 Empirical Methodology

In this study linear panel data model is adopted for estimating our data. Panel data consists of three methods, namely;" fixed effect, random effect and pooled effects". To identify which model is consistent the data used for this study "Breusch-Pagan Lagrange multiplier (LM) test" will adopted for to decide "whether to use a simple OLS regression or the Random Effects model" (Breusch & Pagan, 1980) and the Husman test applied to identify whether random effect or fixed effect model are fited with the data. "The null hypothesis in the LM test states that variance across individuals is zero, which means no significant difference across units (no panel effect)" (Breusch & Pagan, 1980). "This test evaluates if the individual effects are uncorrelated with other variables in the regression model "."When the null hypothesis is rejected, the Fixed Effects model is more appropriate compared to Random Effects, which is inconsistent "(Hausman, 1978). The result for all test will be discussed. However to analyses the effect of land locked dummy the study include simple OLS regression.

Pooled OLS Method: the pooled model neglects time –serous and cross sectional nature of the estimation**.** The regression has common constant. we can write pooled OLS model as

$$Yit = a + \beta Xit + vit \ (2)$$

Where i represent 1…N and t represent 1…T

Where yit is the dependent variable, Xit is independent variable and vit is the stand error term. "Random effect model has homogenous slopes although the intercepts are not the same both in time and cross section. The panel effect model can be represented by the following".

$$yit = a + \beta Xit + vit \qquad (3)$$

$$vit = \lambda it + \mu it \qquad (4)$$

$$yit = a + \beta Xit + \lambda it + \mu it \qquad (5)$$

Where i represent 1…N and t represent 1….T,

Fixed effect model: "As for the fixed effect model, the intercept varies while the slopes are homogeneous in both i and t. There exists marked difference within cross section in this model and the dummy variables are used to represent each country". The fixed effect model can be in this form,

$$yit = a + \beta Xit + vit \qquad (6)$$

$$Where\ i = 1…N\ and\ t =1…T$$

$$vit = \lambda it + \mu it \qquad (7)$$

Random Effects model (REM): "In this model the cross section units will have random intercept instead of fixed intercept. In the fixed effects model we replace $\beta 1i$ by $\beta 1$ (equation 11) which is the mean value of cross section unit intercepts and random error term ε i the deviation of individual intercept from the mean value ($\beta 1$) with mean value of zero and variance of $\sigma^2\varepsilon$".

$$\beta 1i = \beta 1 + \quad i \qquad (8)$$

$$Yit = \beta 1 + \quad i + \beta 2\ xit +... \beta N\ xit + uit \qquad (9)$$

$$Yit = \beta 1 + \beta 2\ xit +... \beta N\ xit + wit \qquad (10)$$

$$wit = \quad i + uit \qquad (11)$$

As we see in equation 11 "*Wit* is the sum of ε i and *uit* where ε i cross section unit error term and uit is a combination of both cross section unit and time series error

term".

4.2.1 **Advantage of Panel data regression**

There are many benefits of panel data regressio. Balitagi 2001 indicated "Panel data helps us to controls heterogeneity of cross-section units such as individuals, states, firms, countries etc… over time. Panel data estimation considers all cross-section units as heterogeneous. It helps us to get unbiased estimation. There are time invariant and state invariant variables which we observe or not". As Baltagi 2001 "stated compared to pure cross section and time series, panel data estimation is better to identify and measure effects of independent variables on dependent variables what we cannot measure using time series and cross section data".

In addition to that ''Panel data give more informative data, more variability, less collinearity among the variables, more degree of freedom and more efficiency. It is also better estimation method to study the duration of economic states and the dynamics of change over time"(Baltagi 2001).

CHAPTER FIVE: FINDINGS AND DISCUSSION

5.1 Introduction

The analysis starts with summary of the descriptive statistics of the variables used in the estimation. In the result section we have three estimation .The first baseline estimation includes all variables except political stabilities and one year lag of FDI. Then Political stability and lag FDI are included to the regression to indicate the effect of each measure apart. In the second four interaction effects are included in the model to determine whether infrastructure development or political stability affect ODA in the promoting FDI and whether political stability or the availability of natural resources positively affects trade openness in promoting FDI. Finally, in the third, the dependent variable has been changed to ODA.

5.2 Descriptive analysis

The results are displayed in table5.1 The "correlation matrix" in table5.2 shows that FDI highly correlated positively trade openness (TRD), infrastructure(INFR), political stability and first lag of FDI and no significant correlated with Official Development Assistance .the data also show FDI significantly correlated with explanatory variables, Official Development Assistance(ODA) have a negative correlation with GDP , trade openness(TRD), infrastructure and Labor force participation rate(LABF).

Table 5.1:   Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
logFDI	1014	.3427557	.5925023	-1	2.208979
logoda_L5	1183	.7983209	.5520874	-2.443837	2.28336
logGDP	1188	9.677725	.6455442	8.003491	11.75473
logTRD	1126	1.820209	.2139408	1.045323	2.725667
logINF	1028	.8965221	.5805355	-1	4.427519
logINFR	1188	1.167991	.7717747	-2	2
logDCP	1110	1.08195	.3884705	-.39794	2.204391
logLABF	1188	1.728576	.0334503	1.673942	1.850033
logTRR	1188	.831301	.7111939	-3.149828	1.916924
logPSV	1188	.2621721	.275141	-1.247411	1.463901
logfdi_L1	1013	.3427759	.5927946	-1	2.208978
LALD	1188	.3400673	.473931	0	1

Table 5.2: Correlation matrix

	logFDI	logoda~5	logGDP	logTRD	logINF	logINFR	logDCP	logLABF	logTRR	logPSV	logfdi~1	LALD
logFDI	1.0000											
logoda_L5	0.0595	1.0000										
logGDP	0.0389	-0.3654	1.0000									
logTRD	0.4697	-0.1331	-0.2180	1.0000								
logINF	0.0334	0.0044	0.0544	-0.0125	1.0000							
logINFR	0.1311	-0.2372	0.3420	0.2548	-0.1508	1.0000						
logDCP	-0.0304	-0.3405	0.2792	0.2458	-0.2646	0.3670	1.0000					
logLABF	0.0753	-0.4710	0.1323	0.4308	-0.1483	0.4944	0.5616	1.0000				
logTRR	0.1403	0.2670	0.0892	-0.2012	0.1939	-0.3211	-0.4767	-0.6432	1.0000			
logPSV	0.2828	-0.0750	0.1700	0.2182	-0.2343	0.3639	0.3071	0.3421	-0.1169	1.0000		
logfdi_L1	0.7004	0.0422	0.0503	0.4501	0.0552	0.0915	-0.0201	0.0604	0.1443	0.2571	1.0000	
LALD	-0.1291	0.1268	-0.0843	-0.1750	-0.0542	-0.2580	-0.1132	-0.2272	0.0998	0.0453	-0.1224	1.0000

5.3 Result

To identify the relationship among FDI and Official Development Assistance, Market size, Trade openness, Macroeconomic stability, Infrastructure, Domestic credit to private sector, Labor force participation rate, Natural resources and land locked effect variables, As mentioned in the methodology section, a "Breusch-Pagan Lagrange multiplier (LM)" test and a "Hausman test" are applied in order to examine the appropriate estimation method for this analysis. The test result puted on the Appendix 2. Biased on the result, both result suggest to reject the null hypothesis Therefore, the LM test shows that the Random Effects method is more

appropriate than OLS, while the Hausman test result proposes that the Fixed Effects model is favored. Therefore, in this study fixed effect model is the Applicable estimation method. The study analyzed the 44ssa Countries sample data and the dummy variable introduces to analyses the landlocked effect of FDI inflow. in order to cheek the landlocked effect OLS estimation method applied on the main regression.

The major regression results can be found in Table 5.3. The first arrangement shows the panel OLS regression result, this metho applied only to cheek the landlocked effect of FDI inflow to landlocked SSA countries. In the rest three arrangements indicates that the fixed effect results, the baseline model, including all control variables, in the third and fourth the study included political stability political stability and absence of violence and first lag of FDI.

The general finding from the estimation results indicate, the coefficients for, Gross Domestic Product, trade openness, Inflation, Domestic credit to private sector, infrastructure, are all significant and have the predicted signs. On the other hand, the coefficients for Official development assistance natural resources and labor force are not significant. The result for OLS estimation show and land locked countries dummy is not significant. The result indicated that according to its strong significant positive sign in specification 1, 2, and 3, among all variables, infrastructure, macroeconomic stability and openness seems to be the most vital factors in promoting more FDI inflow in to SSA countries.

**Table 5.3: Fixed Effects Estimation Results Dependent variable: FDI inflow as %
of GDP**

	Panel OLS	Fixed Effect	ps&Av	L1_FDI
Logoda_L5	0.156***	0.0152	0.0279	-0.00579
	(4.11)	(0.37)	(0.68)	(-0.14)
logGDP	0.233***	0.182**	0.0595	0.0395
	(6.58)	(2.71)	(0.82)	(0.61)
logTRD	1.691***	1.580***	1.473***	0.975***
	(17.01)	(9.59)	(8.93)	(5.87)
logINF	-0.0566	-0.0958**	-0.0959**	-0.0903**
	(-1.65)	(-2.77)	(-2.80)	(-2.61)
logINFR	0.0140	0.136***	0.107**	0.123**
	(0.42)	(3.34)	(2.62)	(3.21)
logDCP	-0.231***	0.196*	0.163	0.0873
	(-3.92)	(2.26)	(1.89)	(1.07)
logLABF	0.257	1.801	-0.0533	1.237
	(0.31)	(1.24)	(-0.04)	(0.88)
logTRR	0.116***	0.0335	0.0493	0.0705
	(3.38)	(0.53)	(0.79)	(1.18)
LALD	-0.0573			
	(-1.46)			
logPSV			0.340***	
			(4.23)	
logfdi_L1				0.323***
				(9.13)
Constant	-5.395***	-7.795***	-3.246	-4.297
	(-3.83)	(-3.34)	(-1.28)	(-1.88)
Observations	785	785	785	722
Adjusted R-squared	0.337	0.240	0.257	0.293

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

The results show that the effect of ODAs for the attraction of FDI is not significant. The result shows that even if ODA help host countries through covering the financing gap of the countries it's not a complimentary with FDI, The flow of FDI not the amount of aid received by the host countries. On other study "foreign aid promotes FDI inflows from the same aid donors to the recipient nation because the provision of foreign aid send signals on the recipient's business environment to the donor country firms thus making it easy for donor firms to invest". (Kimura and Todo (2010). However this effect is not significant on our data sate. On the other hand ODA promote FDI indirectly throw financing transport, communication and human capital development However, Harms and Lutz (2006) identified that "aid's ability to improve and consolidates favorable domestic investment environment is conditional on which activities it financed". He found that social and economic infrastructure aid are the one reinforce the recipient countries improvement for attract more FDI.

so we can agree that more ODA disbursement in to the "development of transport and communication facility, electricity supply, education and the enhancement of human capital" hence creating the favorable environment for attracting FDI in to the recipient countries through contributes to reducing the cost of doing business and produces the quantity and quality of skilled labor demanded by multinationals.

In the case of Gross Domestic Product (GDP) it's used as a proxy of market size, it has a positive on the attraction of FDI and is statistically significant at a 0.1% level the result shows that the host country market sized is matter in case of SSA countries FDI inflow. Countries whiche has a big market accesses have opportunity to attract more FDI. In their study Skandalis (2012) and Liargova, 2004 have found the same result. The result also consistent with Dunning's OLI framework, which asserts that

"market size attracts FDI inflow from MNCs to a particular location or country". The result also indicated that FDI flow to SSA is more market seeking in nature.

Trade openness has a positive and significant relationship with FDI inflow to SSA countries. The result also showed 1% significant level in all specifications. These results propose that trade liberalization one of the major factors that influents the amount of FDI flow to those countries. And enhancements in policies that liberalize trade regimes which SSA countries have pursued in the last couple of decades do have an impact on investment.

In the case of Macroeconomic stability, it has positive effect on the attraction of FDI in to SSA countries. The result shows that high inflation leads to less FDI inflow and it's is statistically significant at 5% level. The other studies also assured this result. The study finding by Frenkel et al., (2004) also indicate the same result. The same result also showed by Astatike and Assefa (2006) negative effect of inflation on FDI inflow. Moreover, the theory of investment suggests that the "higher the inflation rate the shorter is the planning horizon of firms. Inflation reduces the real return on investment and competitiveness of firms".

The finding that credit availability is positive as a determinant of FDI inflow into SSA and statistically significant at a 10% level. It's supported by to the finding of Scheinder and Frey (1985)" for fifty-seven sample developing countries from different regions. These scholars found that the institutional credit rating as a measure of the availability of credit has significant effect on the flows of FDI on a sample from all regions of developing countries".

The development of Infrastructure has a positive impact on the attraction of FDI in to SSA countries and it's significant at o.1%. This result is expected. Since many studies result shows the development of infrastructure leads to more FDI inflows. Moreover; it is arguably an important precondition for efficiency seeking investment. The low quality of infrastructure in developing countries is not favorable to investors because it increases both production and transportation costs and reduces efficiency. Quality infrastructure can also indicate a richer consumer base of the host country. Thus, a host country with better infrastructure is preferred by investors. The finding is supported by previous study Wheeler and Mody (1992) "find that infrastructure quality is an important variable for developing countries seeking to attract FDI from the United States, but is less important for developed countries that already have high quality infrastructures".

The result for Natural resource rent surprisingly, insignificant. This is in contrast to what is expected. Since, mostly the FDI inflows into SSA countries are resources seeking. This relationship between natural resource rent and FDI should not be taken literally to mean that the abundance of natural resources is   discourage or not matter for the flow of FDI I to SSA countries. The following plausible explanations are provided to justify this negative relationship. First, "local currency can appreciate as a result of huge rent generated from natural resources. This appreciation of local currency can crowd out investment in non-natural resource tradable sectors as a country's exports have already become less competitive" (Corden and Neary, 1982). Second, "countries with higher percentage of minerals and fuels in total merchandise exports are more prone to external shocks since they

are not good in trade diversification. This can result in a decline in FDI as these shocks create macroeconomic instability". Third, "in SSA countries, huge amounts of natural resources remain unused due misplaced priorities and ongoing conflicts between interest groups. Well known cases of militancy and conflicts in Nigeria, Liberia, Sierra Leone, Angola, DRC and the Republic of Congo have halted the exploration and production of natural resources thereby impacting negatively on investments" Asiedu and Lien (2011).

The availability of labor force is not significant in our data sate. On the other hand this study include the implications of being landlocked effect on FDI however the effect of lack of access to see to FDI also insignificant. The result was unexpected and it leads to fall to accept our Hypotheses, which are the landlocked countries has less advantage to attract FDI. However several studies identify it has a negative effect. In the study of (Sachs, 1997). He concludes that "in a certain degree, this geographic position constrains the ability of LLDCs to expand their economies through trade and to take part in global patterns of specialization. It also makes them less attractive as locations for certain types of FDI activity". Biased, the sea- based connection enabling countries to have economic linkages with the rest of the world and also to benefit from economic specialization.

In the second specification political stability and absence of violence is included, in both case the result is significant and positive of which the coefficient is highly significant and has a positive sign. Thus, an improvement of political stability will increase the inflow of FDI. This supports by the study by (Aisen & Veiga, 2011).He argues that Political instability is likely to shorten policymakers' horizons leading to

suboptimal short term macroeconomic policies. It may also lead to a more frequent switch of policies, creating volatility and thus, negatively affecting macroeconomic performance (Aisen & Veiga, 2011). Furthermore, Fosu (1992) studied political instability, instability of governments, regimes, and communities within a nation, and growth in sub-Saharan African countries and found adverse impact of political instability on economic growth. In general, political instability affects the investment climate. Politically stable countries have relatively better chances to attract both efficiency and location seeking MNCs.

Finally, the third regression includes one year lag of FDI. The effect of the past FDI on the current FDI is positive and statically 0.1% significant. In other study of Anyanwu (2011), the result also shows significant and positive for SSA countries. The result indicates that to minimalize risk and to gazer information about host countries investment effectiveness mostly prefer a place where other companies already invest.it means that the existing investment encourage the new companies to invest in host countries.

5.3.1 Interaction effects

The results of the interaction between five years lag Official development assistance with infrastructure development and political stability and the interaction between political stability and trade openness different in the attraction of FDI show in Table 5.4. The first condition includes the effect of first lag ODA and infrastructure development. Even if our main result not indicates a significant effect of ODA for the attraction of FDI, in the case of interaction with infrastructure the result shows significant and positive effect at 1% level. This result proposes that wen ODA interact with infrastructures it will attract more FDI in to SSA countries. it means that when countries spend more financing in to infrastructure, the improvement of infrastructure will increase. It will help through attracting more MNCs particularly,

efficiency seeking investors. A possible reason for this could be that when the recipient countries allocate more ODA into infrastructure development including transport (i.e. electric power roads, railways, and airports), logistical and communication system, the more likely it is for a country to attract more FDI. This result is consistent with Babatunde (2011), he found the similar outcome for countries in SSA. Additionally, (Harms& Lutz 2006) also isolated the effect of foreign aid on FDI "who suggest that the infrastructure effect is positive through improved recipient country infrastructures which all tie in to raising the marginal productivity of capital and encouraging FDI inflows".

Next, the second specification includes the interaction of five years lag of ODA and political stability. The result shows positive and 0.1% significant level. Hence, it's Hence, it is reasonable that the effect of political stability on ODA allocation as well on promoting FDI Also in this case, it is likely that more politically stable countries allocate ODA in effective way, it means that the more effective policy in to the allocation of ODA indirectly attract multinational enterprises. Moreover, allocations of ODA for specific sectors (Infrastructure development and human capital Aid) are more conceivable.

The third specification includes the interaction of openness and political stability. The coefficient shows significant and positive at 0.1% . The result indicates that with open economy politically stable SSA countries attract more FDI. Political instability leads to worse trade openness, both intensive and extensive trade margin. Moreover, based on other study they found that some evidence that higher poltical instability led to higher volatility of trade openness. (Daryna Grechynawe). The findings suggest in that in open economy political climate improvement policies enable to driving more FDI inflow in to the host countries. As well as it improved countries trade to the rest of the world, both in terms of having more partner and increasing

trade volume.

Table 5.4 1: Fixed Effects Estimation Results: Interaction Effects Dependent variable: FDI inflow as % of GDP

	INF&ODA	PS&ODA	PS&OPN	NRR&OPN
logoda_L5	-0.149*	-0.0377	0.0304	0.0153
	(-2.50)	(-0.91)	(0.74)	(0.37)
logGDP	0.167*	0.0451	0.0652	0.181**
	(2.50)	(0.64)	(0.90)	(2.68)
logTRD	1.558***	1.400***	1.451***	1.617***
	(9.54)	(8.50)	(8.72)	(7.67)
logINF	-0.0924**	-0.0968**	-0.0960**	-0.0954**
	(-2.69)	(-2.86)	(-2.80)	(-2.75)
logINFR	0.0365	0.0905*	0.110**	0.137***
	(0.76)	(2.23)	(2.69)	(3.35)
logDCP	0.186*	0.153	0.170*	0.195*
	(2.17)	(1.80)	(1.98)	(2.25)
logLABF	3.169*	1.666	-0.100	1.786
	(2.13)	(1.17)	(-0.07)	(1.23)
logTRR	0.0302	0.0702	0.0497	0.104
	(0.49)	(1.14)	(0.80)	(0.40)
INFRODA	0.159***			
	(3.80)			
PSVODA		0.391***		
		(5.66)		
PSVTRD			0.174***	
			(3.95)	
NRRTRD				-0.0392
				(-0.28)
Constant	-9.857***	-5.870*	-3.190	-7.826***
	(-4.15)	(-2.54)	(-1.23)	(-3.35)
Observations	785	785	785	785
Adjusted R-squared	0.254	0.271	0.255	0.239

Finally, the forth specification includes the interaction of natural resources and openness on FDI. This helps us explore whether openness play a role in the ability of a country to use natural resources to its advantage and reap its benefits by attracting more FDI. However the result is not significant.

5.3.2   Robustness checks

In the "robustness check", the dependent variable has been changed to ODA (GNI %); see the result on Table 5.5 in the Appendix. However, the effect of FDI in the flow of ODA is not significant. The result tells as ODA flows into SSA countries are not determined by the amount of FDI receipt by host countries. Additionally, with regards to the GDP, shows negative coefficient and highly significant in 0.1 % level. It is likely that an increase in a country's GDP will lead to decline the inflow of ODA. Moreover, the result indicates that donor countries allocate its ODA to countries with lower GDP or lower income countries. Finally, the results of trade openness also show positive coefficient and 0.5% significant level.   The result indicates the economic interest of donor countries with recipient countries.

48

CHAPTER SIX: CONCLUSION AND POLICY IMPLICATION

This study examined the factors that determine FDI inflow in to SSA countries from the period 1990 to 2016. There were three methods applied to analyses panel data, Which are "pooled ordinary least square method", "fixed effects method" and "random effects method". Fixed effect method was found that appropret for this study based on Breusch-Pagan Lagrange multiplier (LM) test and the Husman test result. The estimation results shows that market size, openness, Domestic credit to private sector, infrastructure political stability and lag FDI are affect foreign direct investment positively. Inflation is negative and significant while Official development assistance, landlocked, natural resources, labor force are not significant. The finding indicates that FDI inflow into SSA countries is mostly market seeking in nature. Based on the findings, a number of policies can be targeted and amended by the governments of SSA countries. The policy implications based on the determinants of FDI inflows are discussed as follows.

The result indicates that ODA is not significant with FDI. However in the case of ODA interact with FDI the result show positive and significant effect for FDI inflow to SSA countries. So base on the result we can conclude that the flow of FDI into SSA is not determined directly by Aid received by host countries. Nevertheless, ODA promote FDI indirectly through financing infrastructure. The recipient country infrastructure condition is one of the determinants of FDI for investor so investing Aid on infrastructure which all ties in to increasing the FDI inflow and marginal of capital. Moreover it will improve production method and output and in turn encourage investors in the improved markets. As SSA countries are major recipient, by increase ODA disbursement in to infrastructure development they can attract

more FDI.

The level of development of both physical and institutional infrastructure is one of the determinants of FDI inflows into SSA. The fact that SSA countries are unable to attract more FDI (particularly in the manufacturing sector) is directly related to the lack of efficient infrastructure. For African governments, it is advisable to solve these problems by allocating reasonable funds especially for physical infrastructure and encouraging the expansion of institutional infrastructure by the private investors.

In this study Openness also one of the key determinants of FDI inflow in the region. Since, export is associated with trade; through promoting export the government should move their countries towards industrialization. In recent decades, Many countries has been conducting in that way and they were improve their economy and created more work opportunities for labors.

Sub-Saharan African countries are endowed with large variety and abundant volume of natural resources. Even if this study not show significant relationship between Natural resource FDI inflow into SSA countries, through Making detailed geological and physical information available is helpful to attract foreign investors; linking the sites of the resources with sufficient infrastructure, forwarding clear and transparent policies and legal frameworks, liberalizing the natural resource utilization are good measures to be taken to attract FDI.

Market size, is one of the basic determinants. What are important are not only GDP, but also market infrastructures. The size of markets can also expand through regional integration. Sub-Saharan African countries need to encourage and strengthen the regional integration frameworks that have been under way at sub regional level. Through both demand and supply aspects it's possible to strengthen

the link between regional integration and the attraction of FDI. Many SSA countries are small in terms of market size so in the demand side aspect countries can improve their market access through entering into regional agreements. It providing access to a larger market than their own and also increase their attractiveness for MNC, s. The reduction of tariffs and other barriers among countries comprising a region bloc creates, in effect, one large market that is attractive to market seeking investment. On the supply side, regional integration enables SSA countries or the African continent to capitalize on regional production advantage by focusing on value-added activities. In this context, SSA countries complement each other with precisely targeted investment that could enable to benefit from them. Moreover encouraging a joint FDI promotion programmers with their immediate neighbors, and capitalize on the comparative advantage of each also the effective way to maximize benefit and to minimize cost of trade and investment in the region as a whole.

On the other hand Macroeconomic stability also one of the major determinants of FDI inflow in to SSA countries. There is a consensus that all forms of investment prosper best in a macrocosmic environment that is stable, predictable and competitive. The implication is that governments should attach top priority to the correction of unsustainable macroeconomic imbalances so that investors can respond to different forms of incentives. For SSA, inflationary monetary and tax policies should be minimized to make the price stable.

Overall FDI policies of the host countries also matter the descriptive statistical data shows that in the period after the mid-1990s, the level of FDI flowing to most of the SSA countries relatively rose compared to the previous periods. As well as FDI in to non-resources rich countries also increased. One of the reasons for this is the policy reforms taken by most of African countries which are privatization, Liberalization of ownership restrictions, state disengagement from economy and dissemination of information regarding opportunities of investment are some of the measures previously taken by some of the countries. These policies need to be strengthened

and it is important if governments go ahead with the policy reforms to attract FDI. As this globalize world the main objective of each FDI polices reform is to maximize the net benefits from FDI even if there is main factors for determinant FDI for each countries, Labor force participation rate, Macroeconomic stability, Natural resources and Market size are the main determinants of this study, however each measure taken should consider the costs and benefits of the inflows.

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Appendix 1: List of SSA countries Included in this study

Country Name		
Angola	Gambia, The	Nigeria
Benin	Ghana	Rwanda
Botswana	Guinea	Senegal
Burkina Faso	Guinea-Bissau	Seychelles
Burundi	Kenya	Sierra Leone
Cabo Verde	Lesotho	South Africa
Cameroon	Liberia	Sudan
Central African Republic	Madagascar	Swaziland
Chad	Malawi	Tanzania
Comoros	Mali	Togo
Congo, Dem. Rep.	Mauritania	Uganda
Congo, Rep.	Mauritius	Zambia
Cote d'Ivoire	Mozambique	Zimbabwe
Equatorial Guinea	Namibia	
Ethiopia	Niger	
Gabon		

Appendix   2: Breuschandpagan Lagrangian Multiple test

```
Breusch and Pagan Lagrangian multiplier test for random effects

        logFDI[Country1,t] = Xb + u[Country1] + e[Country1,t]

        Estimated results:
                        |       Var      sd = sqrt(Var)
                --------+-----------------------------------
                logFDI  |    .3440826        .5865855
                     e  |    .1543397        .3928609
                     u  |    .0683497        .2614378

        Test:   Var(u) = 0
                        chibar2(01) =    467.88
                      Prob > chibar2 =   0.0000
```

Appendix   3: Hausman Test

. hausman fe re

```
                  ———— Coefficients ————
              (b)           (B)            (b-B)      sqrt(diag(V_b-V_B))
              fe            re           Difference          S.E.

 logoda_L5    .0151946      .061102       -.0459074         .0114506
   logGDP     .1819204      .2267218      -.0448014         .0417757
   logTRD     1.580085      1.604964      -.0248794         .0878796
   logINF     -.0958182     -.0963445      .0005263          .007651
   logINFR    .1355979      .1016718       .0339261         .0132038
   logDCP     .1958658      .018981        .1768848         .0424458
   logLABF    1.800609      .4562616       1.344347         .8929105
   logTRR     .0334848      .1346414      -.1011567         .0399818
```

```
              b = consistent under Ho and Ha; obtained from xtreg
          B = inconsistent under Ha, efficient under Ho; obtained from xtreg
```

```
   Test:  Ho:  difference in coefficients not systematic

              chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =       38.53
          Prob>chi2 =      0.0000
```

Appendix 4: Fixed Effects Estimation Results: Robustness Check

Dependent variable: ODA (GNI %)

	Baseline	ps&Av
logfdi_L5	0.00570	0.00735
	(0.29)	(0.38)
logGDP	-0.616***	-0.641***
	(-6.65)	(-5.93)
logTRD	0.378**	0.356*
	(2.74)	(2.49)
logINF	0.0346	0.0340
	(0.97)	(0.94)
logINFR	0.0106	0.00656
	(0.40)	(0.26)
logDCP	0.378***	0.373***
	(4.86)	(4.87)
logLABF	-1.970	-2.313
	(-1.36)	(-1.61)
logTRR	-0.0289	-0.0245
	(-0.81)	(-0.69)
logPSV		0.0626
		(0.96)
Constant	9.087***	9.953***
	(4.39)	(4.48)

| Observations | 769 | 769 |
| Adjusted R-squared | 0.467 | 0.468 |

----

t statistics in parentheses

* $p<0.05$, ** $p<0.01$, *** $p<0.001$