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Foreign Direct Investment and Uncertainty in Africa

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ABSTRACT

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In the past two decades, there has been a significant increase of FDI flow to all developing countries. However, Africa still lags behind in the attraction of this investment. Why African has received a little FDI inflows as compared to other developing countries is the starting question of this study. Theories suggest that the prevailed uncertainty in Africa is considered as a reason for the poor FDI attractions. Having this concept, the paper examines wheather macroeconomic uncertainty and political instability affect inflow of foreign direct investment (FDI) to Africa. The study estimates both fixed and dynamic GMM Panel-data models using data from 25 African countries over the period 1995 to 2009. Unconditional standard deviations are applied to capture macroeconomic volatility and state fragility indices are taken to measure political instability and institutional strength towards corruption. We find that macroeconomic volatility proxied by inflation has a deleterious impact on FDI inflows to Africa while exchange rate volatility has no statistical significance. We also find that level of corruption and political instability are not statistical significance

Key word: FDI, Macroeconomic Uncertainty, Political instability and corruption

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God bless Ethiopia!

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1. INTRODUCTION

1.1. Statement of the Problem

Over the last two to three decades inflows of foreign direct investment (FDI) have increased in almost every region of the world as well as in Africa (Sandy, 2003). However, comparing to other developing countries, countries of sub- Saharan Africa have not received a proportional share of the unprecedented FDI inflows to all developing countries. A report from the World Bank (2001) indicates that only 59% FDI inflows grew in sub-Saharan African countries over the period 1988-98. Comparing to the rest of the world, 5200% grew in Europe and central Asia, 942% for East Asia, 662% for all developing countries. This conveys a message that Africa still lag behind to be benefited from FDI inflows. Moreover, UNCTAD (2009) described that the distribution of FDI flows in the region is getting evener, with 29 out of the 47 countries in the region recording increase in FDI inflows in 2008. Here, the problem today is, Africa still face the same experiences as yesterday; it continues to receive the least FDI (Ezeoha and Cattaneo, 2010).

Economists put some arguments regarding the importance of FDI for economic development for all developing countries especially Africa. Among these, most African countries are characterized by low domestic savings and international capital markets have become inaccessible as results of the debt crisis are the fundamental reasons for slower growth of FDI. This point out foreign direct investment (FDI) is expected to play a significant role in the development process of African economies and further helps in achieving of the Millennium Development Goal (MDG); halving its proportion of people that live in extreme poverty (United Nation Millennium declaration, 2000).

Te-Velde (2002) has noted two conditions should be recognized and addressed regarding the development of FDI in Africa. The one that is, it is better to understand African (SSA) countries attract only a small share of total FDI flows as compared to other developing countries. Secondly, concerns should be taken as to whether FDI really leads to economic and social development in SSA. Theory suggests that apart from inefficient market access and resource endowments, the prevailed uncertainty and lack of good governance in Africa contributed for the sluggish growth of FDI in the region.

In different times different authors' (eg. Lemi and Sisay, 2001; Blen, 2006) mentioned that there are several variables explain uncertainty in Africa. Variables like macroeconomic uncertainty (exchange rate volatility, inflation), lack of good governance, political instability, corruption and others are considered for the poor attractiveness of FDI of the continent. Moreover, the slight increase of FDI that is registered in most African countries emanates from countries like China, India, and Malaysia which have not lay or embrace good governance government as a crucial requirement for their outflow of FDI.

How can make Africa to be really benefited from the inflow of FDI should be a question for all African. This is because FDI in its package possesses employment creation, technology transfer, and capital inflows and these benefits bring critical differences when we compare to international trade. Otherwise FDI, like other underground investment has brought huge cost compared to the expected gain from FDI. Thus theories suggest that achieving good governance system should be taken a prior agenda. Otherwise, the cost associated with the FDI inflows goes too much higher than the benefit those countries receive. The sources of uncertainty to the multi- national companies (MNCs) are therefore changing the conditions of operation and this may lead to costly investment. These conditions push them engage in underground activities which invites additional costs on the economy. Finally costs tend to increase infinitely and harm total economy (Mulat, 2009).

There are studies that are conducted by different scholars based on FDI and uncertainty in Africa. Lemi and Sisay (2001) give emphasis to macroeconomic uncertainty conditions but they did not include the effect of corruption in their investigation. Moreover, their study covers the time period from 1975-1997, meaning that it lacks some description of the current scenario. The other study is conducted by Blen (2006), entitled on the roles of exchange rate uncertainty, political risk and host country institutions on FDI to Africa. The content is much similar to Lemi and Sisay (2001), but additionally she included the corruption variable to measure institutional strength. Her study also shows some time gap because her study period covers years from 1985-2004, it counts 6 years from now and requires some updates to see the current situations. Asiedu (2006) examined political risk and institutions on FDI inflows to Africa; however macroeconomic variables are missing. These all show there are still a gap that should be covered and encourage further investigations. Now, the study that we are going to do is attempting to fill the gaps in searching the connection between uncertainty and the flow of total FDI from all source countries. This study employs panel model and investigates possible variables that could affect FDI inflows to Africa from the period 1995-2009 and fill gaps not covered by others.

1.2. Objective of the Study

The main objective of this paper is to analyze the role of uncertainty in affecting capital inflows to African economies. The specific objectives of this study are investigating the major macroeconomic uncertainty, volatility of exchange rate and inflation on the inflows of FDI in Africa. Beside this, the effect of political instability and corruption level on FDI inflows has been examined. In line of this, other determinant variables that contribute for the sluggish development of FDI in Africa are being investigated.

1.3 Organization of the Study

The structure of this paper is as follows: Chapter 2 provides theoretical issues and empirical evidences. This chapter focuses on the general FDI theories and the relationship between FDI and uncertainty. It also describes other determinant variables that are expected to have direct link to FDI inflows to Africa and their empirical works. Chapter 3 develops methodological framework of the study. Chapter 4 devotes on analysis of the result. The last chapter presents the conclusion part.

2. THEORETICAL ISSUES AND EMPIRICAL EVIDENCES

2.1. *Theoretical Issues*

2.1.1 Theories of FDI

In the current globalized world, only theories of international trade could not explain beyond border economic relations among countries of the world. Even, the new theories of international trade, still cannot explain foreign direct and other forms of international investment (Hosseini, 2005). Nowadays the issue of foreign direct investments is being paid more attention, both at national and international level because it possesses different packages of benefit in it. Denisia (2010) stated the different optimistic ideas of economic theorists towards FDI; it could increase productivity, technology transfer, managerial expertise and knowhow, international production networks, reducing unemployment, access to external markets, and introduction of new processing methods. Moreover, these theorists believed that FDI is an important element in the development process of a country, especially countries which have not adequate saving and inaccessible financial markets (Lemi and Assefa, 2009). Borensztteina *et.al* (1998) noted that FDI may be taken as ways of achieving technology spillovers, with greater contribution to the economic growth than would have national investments. However, he further mentioned that the higher productivity of FDI holds only when the host countries' should have a minimum threshold stock of human capital. Thus, FDI according to him, contributes to economic growth only when a sufficient absorptive capability of the advanced technology available in the host economy.

Morgan and Katsikeas (1997) mentioned three theories that certain theorists have addressed limitations of international trade theories in the explanation of beyond border economic linkages, especially with FDI. The three theories; market imperfection theory, international production theory and internalization theory are relevant in the discussion of FDI. The market imperfections theory states that firms constantly seek market opportunities and their decision to invest overseas can be explained as a strategy to capitalize on certain capabilities not shared by competitors in foreign countries (Hymer, 1970). Fayerweather (1982) advocates international production theory which indicates that the propensity of a firm to initiate foreign production will depend on the specific attractions of its home country compared with resource implications and advantages of locating in another country. Buckley and Casson (1976) stated Internationalization theory with the concept of international trade theory and it centers on the notion that firms aspire to develop their own internal markets whenever transactions can be made at lower cost within the firm. Moreover, internalization theory provides an explanation for the growth of the multinational enterprise (MNE) and gives some insights for the reasons of foreign investment flows.

The popular works of Dunning called the 'electric theory' stated that, Foreign Direct Investment (FDI) is determined by three sets of advantages and these could help to summarize the above three theories. That is, the MNEs must have some advantages specific to the firm and readily transferable within the firm and between countries (Dunning, 1988). The first advantage is the ownership (or O) specific factor which stresses advantage over its rival that emanates from marketing strategy, technology intensity, and brand name or patent right. The second advantage is the location (or L) factor and it implies that the firm is attracted by location specific advantage. This is because of the specific nature of resources, or because of low tariff rates or it may due to low tax rate or market access in the host country, or favorable industry and trade policy, political stability or institutional quality found in the host country especially related to low level of corruption rate and others. The last advantage is the internalization (or I) advantage implies that the MNEs must weigh the relative benefits and costs of the variety of alternative contractual arrangements to determine how it enters the foreign market and expands its operations over time (see Blen, 2006).

Economics defines investment as the act of incurring an immediate cost in the expectation of future rewards (Dixit and Pindyck, 1994). FDI, like any other investment is a forward-looking activity based on investors' expectations regarding future returns and the confidence that they can place on these returns. Uncertainties that will be perceived by the MNCs make investors in doubt on their investment decisions and erode confidence on future returns; consequently, this will affect the inflows of FDI in certain countries. The next section will see Uncertainty variables in relation to FDI.

2.1.2. FDI and Macroeconomic Uncertainty

Globalization and technological innovations create investment opportunities for enterprises worldwide and at the same time countries compete to attract foreign businesses inflow in to their economy. Foreign Direct Investment (FDI) is one investment option firms choose when expanding into international markets. Different authors describe different uncertainty variables such as macroeconomic volatility, political instability and level of corruption in a country and they argue that these are competing factors that affect receiving increased attention in international business process (see Asiedu, 2006; Lemi and Assefa, 2009; Harrison, 2003). Hence, it is expected that investors investigates uncertainty variables that going to affect their profitability conditions about future prices, rates of return, and confidences on non economic conditions (Dixit and Pindyck, 1994). With respect to African countries as stated by Asiedu (2005), the main factor inhibiting increased inflow of FDI is high risk which is demonstrated by a lack of political and institutional stability, price instability, high level of corruption, and constraints on the executive market size and good infrastructure quality (stagnant markets). Moreover, there are other variables inhibit inflows of foreign investment; far distance from leading markets of the world, being land-locked, inefficient market size, and unfavorable policy conditions (UNCTAD, 2005). This report also indicates that, apart from macroeconomic conditions, most countries in the region also characterized by a reputation for persistent political conflicts and highly inefficient financial systems. Hess (2000) noted that investors require certain stability on macroeconomic and political environment to have confidence on their investment.

According to Hauser (2005) one important source of uncertainty which makes foreign direct investment different to local investments is the occurrence of country specific risks. Volatility of exchange rate, inflation, political instability, level of corruption, and other economic and political factors are considered to be risks on FDI inflows. At the country level, the prevalence of different evidences indicates a negative relationship between FDI and those variables, meaning that higher volatility is associated with lower investment (Aghion*et.al*, 2010). Fisher (2011) pointed out that, this negative relationship is particularly strong in less developed countries, where prices tend to be more volatile.

Macroeconomic volatility plays a key role in the decision of foreign investors to locate new FDI or expand existing ones in a country. Udoh *et.al* (2008) stated such volatility represents one type of measure of uncertainty which investors expected to include in their decisions of investment. Different studies captured macroeconomic volatility through Exchange rate and inflation volatility.

Aizenman (1992) suggests that further attention should be given for the influences of the propagation of exchange rate systems on the flow of investment, including FDI. Goldberg (1995) noted that exchange rates can influence the flow of foreign direct investment and the allocation of this investment costs have impacts across a range of countries. When a currency depreciates according to Goldberg, meaning that its value declines relative to the value of another currency has brought two potential implications for FDI. First, he argues that, it reduces the real wages and production costs in the host country relative to those of its foreign counterparts. However, other things remain constant; a positive relationship is expected if the purpose of FDI is to diversify location of production ("locational" advantage) or increases market share (see Blobigen, 2005). Achieving positive relationship, it should rely on a number of considerations and Goldberg (1995) put the conditions as follows:

"First, the exchange rate movement needs to be associated with a change in the relative production costs across countries, and thus should not be accompanied by an offsetting increase in the wages and production costs in the destination market

for investment capital. Second, the importance of the "relative wage" channel may be diminished if the exchange rate movements are anticipated."

On the other hand, if the purpose of FDI were either to serve other markets (engages in the international trade) or bring production back to the home country, a negative relationship between FDI and exchange rate uncertainty would arise (Blonigen, 2005). Udoh *et.al* (2008) explained the negative relationship between the two in a way that uncertainty of exchange rate makes the variance of expected profits rises and its net present value falls. In general, as Brada, *et.al,* (2004) stated, volatility of exchange rate affects the value of the host country's currency and causes reducing the value of the investment as well as the future profits generated by the investment.

Regarding inflation, Friedman (1977) provided an intuitive argument that higher inflation leads to more uncertainty. Ball (1992), using an asymmetric information game, offers a formal derivation of Friedman's hypothesis that higher inflation causes more inflation uncertainty and more inflation uncertainty would be accompanied by less output growth.

2.1.3 *Theories of the effect of corruption and political instability on FDI*

Asiedu (2005) stated that the common perception in most studies of Africa is that FDI is largely driven by natural resources and market size, however the effect of corruption and political instability on the inflow of FDI are being neglected. Khan (1996) defines corruption as:

"an act which deviates from the formal rules of conduct governing the actions of someone in a position of public authority because of private - regarding motive such as wealth, power or status".

Getz and Volkema (2001: 9) define the term corruption as:

'the abuse of public roles and resources for private benefit or the misuse of office for non official ends'.

Bribery, extortion, and embezzlement are the most common forms of corruption in international business and it affects strategic decision of any business activity (Robertson and Watson, 2004). Lawal (2007) has put the corrupt practices span of wide spectrum, where ranging from petty corruption whereby bribes are required before (at the beginning) normal bureaucratic procedures are taken according to him, to large scale corruption whereby considerable sums of money in processes are paid in return for preferential treatment or access.

To give illustrations how it affects the inflow of FDI, Wei (2000) suggest that corruption can be considered as a "tax" on foreign direct investment. This means according to Wei is, the rising index of corruption level in one country is sometimes equivalent to the marginal tax rate on enterprises, meaning that it increases the transaction costs of doing business. The rising corruption in one country not only affects the level of investment; it has influences on market entry and other crucial decisions (Roberts and Watson, 2004). Dahlström and Johnson (2004) noted, corruption makes investors unpredictable and in the way has created uncertainty on net returns.

Shleifer and Vishny (1993) stated that when the central government is weak the real cost of corruption tends to increase and different agencies therefore can collect bribes independently from each other. Lawal (2007) agree that the problem of corruption is severe for African since most people's live in the continent are poor. In the case of weak institution, conduct of corruption is considered to be decentralized which means bribes are collected by several different agents (Shleifer and Vishny, 1993). North (1990) proposed that strong institutions are required to reduce the level of corruption. However, he stressed that, the existence of institutions in one country is not enough to avert the condition of the prevailed corruption, since there are institutions which activities cause transaction cost goes to high. Mulat (2009) stated, without achieving good governance system in the economy, any development activity or supporting aid for development would increase the transaction cost goes to infinity than the benefit accrue. This means according to him, achieving of good governance should be the prior agenda rather than discussion of any development package including FDI inflows. North (1990) supports the idea of Mulat (2009) by saying that corruption is not the cause rather the result of poor institution which may be called lack of good governance. Dahlström and Johnson (2007) is arguing that the existence of wide spread corruption is the result of the lack of functioning market economy.

The other issue that is expected to affect the inflow of FDI is political instability. According to Henisz (2002, 5), political risks can be defined as:

> *'risks that are principally the results of forces external to the industry and which involve some sort of government action or, occasionally, inaction'.*

Different studies refer political environment using the terms like, terrorist threats, political instability, political uncertainty, political governance, political risk, and so on (Lemi and Assefa, 2009). Li (2005) explain different extents of political violence, some of the most extreme of which according to him include civil war, interstate war, and transnational terrorist attacks. Any Investment, including FDI, is a forward-looking activity based on investors' expectations regarding future returns. Political instability is the one that affects expectations regarding future returns and it erodes the confidence that they can place on these returns. Hence, from this perspective, FDI decision forces investors engage in some assessment of the political feature of the host country.

According to Brada *et.al* (2007), political instability has two major negative consequences on the inflow as well as on the progresses of FDI. The one that is domestic instability or civil war or conflict with neighboring countries, and this reduces the profitability of operating in the host country through the channels of disruption of production, weakened domestic and international markets and restricting inputs availability. On the other hand according to them, it likely affects the value of the host country's currency, thus reducing the value of the assets invested in the host country and it has an impact on the future profits generated by the investment.

When we come to African countries, war, conflicts, social unrests, lack of true democracy and oppression of human rights are the phenomena and unfortunately make the continent to be identified by those behaviors. To explain the situation, Reinhart and Rogoff (2001) noted that 40% of the countries in Africa have had at least one war (an extreme form of political instability) during the study period and 28% have had two or more. The probability of such adverse outcomes might have a critical influence on FDI inflows. This is because the occurrence of political and institutional instability might significantly affect firms' costs of operating in a host country.

2.2 Empirical Evidences

Ogunleye (2009) has conducted a study on exchange rate volatility and foreign direct investment in selected Sub-Sahara African countries for a time span of 1970 to 2005 and taking evidence from Nigeria and South Africa. The exchange rate volatility variable was obtained using the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model. The results of the study shows exchange rate volatility have a deleterious effect on the FDI inflows of these countries. The reason why exchange rate volatility induces a reduction in FDI inflows according to Ogunleye (2009) is, it adds to the list of risks inherent in the region or large FDI inflows become endanger in such volatility. He also examines causality between FDI inflows and volatility of exchange rate by applying two stage least square models. He found that exchange rate volatility has negative impact on FDI inflows, with FDI inflows aggravating exchange rate volatility in both countries (Nigeria and South Africa). This suggests that causation runs both ways. It implies that the pattern of FDI inflows has very significant effect on the exchange rates and exchange rate behaviors have also influence on FDI inflows. In line of the above study, Fountas *et.al* (2002) concluded that among many other factors, the exchange rate regime in place plays an important role in influencing the attractiveness for FDI for a region.

Cushman (1985) stated that both inflation rates and exchange rates bring uncertainty and he stresses that, random fluctuations in the real exchange rate can lead to a variety of risks and have effects on direct investment. His Pooled estimation results for U.S. annual, bilateral direct investment flows to five industrialized countries show that real exchange rate increase stimulated FDI made by USD, while a foreign currency appreciation has reduced American FDI. Aizenman (1992) supports the idea of Cushman in the explanation of that, a fixed exchange rate regime is more conducive to both domestic and foreign direct investment, relative to a flexible exchange rate.

Udoh and Egwaikhide (2008) have investigated the effect of exchange rate volatility and inflation uncertainty on foreign direct investment in Nigeria. The data spans of the article covers 1970 to 2005. Exchange rate volatility and inflation uncertainty were estimated using the GARCH model. The findings of the GARCH model show that inflation and exchange rates exhibited high volatility. Results of the regression entail that volatility in the inflation and exchange rates significantly affect FDI in the country. Beside the macroeconomic uncertainty, the political unrests in the sample period hindered FDI inflows into the country. The infrastructure variable and the effect of growth rate of the economy are positive and significant. Financial sector development which is proxied by domestic credit to the economy and the real interest rate are negatively affects FDI in the country.

The paper conducted by Lemi and Assefa (2001) examines the impact of economic and political uncertainty on foreign direct investment (FDI) flow to African economies from all source countries and special attention was given to total U.S. FDI flow to sample host African countries. In their study total U.S. FDI outflow is classified in to two, U.S. manufacturing FDI and U.S. non-manufacturing FDI flows. The period of analysis for the flow of FDI from all source countries is 1987-1999; whereas for U.S. FDI flow is from 1989-1998. They employ Generalized Autoregressive Heteroscedastic (GARCH) model to check presence of macroeconomic volatility; inflation and exchange rate volatility. Their result indicates that the impact of uncertainty on the inflow of FDI to Africa from all source countries is insignificant. However, for U.S. manufacturing FDI, only political instability and government policy commitment are important factors whereas for U.S. non-manufacturing FDI, economic uncertainties are the major impediments only when coupled with political instability and debt burden of host countries. Other determinant factors such as labor, trade connection, size of export sector, external debt, and market size are assessed and these variables are significant in affecting FDI flow to African economies.

Rogolf and Reinhart (2003) explain inflation situations in Africa compared to other regions of the world. They found that Africa's inflation track record is far worse than Asia's track record. The study entails that in some African countries the average inflation during 1970-2001 reached to above 40 percent. Among these countries the highest share was taken by Democratic republic of Congo, it was about 1112.9 and Zambia registered the lowest, 41.1 percent. The total regional average excluding Congo according to the study was 12.4 percent. This message entails that inflation is the experience of most African countries. In relation to its effect on foreign direct investment, they examined and conclude that the recorded inflation has a negative impact on the inflow of FDI to Africa. This is aggravated, according to them, if the coming FDIs have interests to engage in the international trade. The current, 2011, international financial statistics (IFS) data show that inflation situation for the last decade (2000-2009) in Africa was more badly than even the period mentioned in study of Rogolf and Reinhart (see Rogolf and Reinhart, 2003).

In order to provide answer for the question, "can corrupt countries attract FDI inflows?"Harrison (2003) has done a research by making a comparison of FDI inflows between corrupt and non-corrupt countries. Using Transparency International's Corruption Perceptions Index (CPI), as a proxy for corruption level, the study analyzed based on descriptive and statistical correlation techniques for FDI inflows for the 20 least-corrupt and the 20 most-corrupt countries for the time period of 1998-2000. The results show that the least corrupt countries attract larger amount of FDI inflows than high corrupted countries. However, according to the study sixteen out of the 20 least-corrupt countries outperformed based on the FDI Performance Index while eleven out of the 20 most-corrupt countries outperformed based on the FDI Performance Index. This entails that high corrupt countries can also attract FDI inflows.

Asiedu and Lien (2011) examine whether resource rich countries alter the positive relationship between democracy and FDI inflows. To do the study, they employ dynamic linear panel data estimation techniques using data from 112 countries for a time span of 1982 to 2007. Their results show that the effect of democracy on FDI depends on the importance of natural resources in the host country's exports. Meaning that democracy promotes FDI where the share of minerals and oil in total exports is less than some critical value. This study seems to answer the condition that FDI inflows in a situation where political instability exist in a country, since availability of natural resources in a country alters the negative relationship between FDI inflows and political instability (Harrison, 2003)

Globerman and Shapiro (2003) have done a research to examine whether and to what extent governance infrastructure attributes of national economies influence US FDI outflows to other economies. According to their study, governance infrastructure comprises public institutions and policies created by governments as a framework for economic, legal, and social relations. They took data from 143 countries for a period of 1994 – 1997 and applied two stages least square method, in which the first stage investigates the causal factors of the probability that a country is an FDI recipient while the second stage examines the determinants of the amount FDI received. The results of the study convey that an index of political instability and violence, including armed conflict, social unrest, and terrorist threats did not influence the probability whether a country received any FDI inflow, but reduced the amount of FDI inflows to a country.

Using panel data for 16 Organization of Islamic Conference (OIC) countries openings from 2002-2009, Samimi*et.al* (2011) have done a research to investigate the impact of political instability on foreign direct investment. Using regression analysis they found that political stability playing an important role in determining FDI in OCI countries.

3. METHODOLOGICAL FRAMEWORK, AND THE DATA

3.1 The Method and Model Variables

From the previous chapter, several literatures are reviewed which are basically concerning with macroeconomic volatility, political instability and institutional factor, corruption. The recent Transparency International report (2011) indicates the prevailed corruption and political instability in Africa are higher as compared to western and most Asian countries. This section mainly provides the method which captures the effect of the above variables.

Udoh and Egwaikhide (2008) noted that traditional multiplier-accelerator model states that change in capital stock or investment are determined mainly by income and interest rate. However, they further see that there are other factors determine investment; these include risk, government policy and expected return or profitability of investment. They took theoretical inspiration from Fedderke (2002) to measure capital flow determinants in Nigeria. Fedderke (2002) put two factors that determine foreign investment flows; these are rates of return and risk associated with investment. In any country investment can be classified in to two; foreign and domestic.

It is also helpful taking such inspiration for this study since it directly relates to this study. According to Udoh and Egwaikhide (2008), formally individual investor maximizes the function:

$$\int e^{-rt} U(R)dt$$

Where: R is the net expected return on a portfolio of investment. Here the net return is adjusted with the associated cost. Hence, the net return can be defined:

$R^{f} = F^{R} - F^{c}$

$R^{d} = D^{R} - D^{C}$

Where: R^{f} *and* R^{d} denote net foreign and domestic investment return; F^{R} and D^{R} represent foreign and domestic returns; F^{c} and D^{C} denotes the costs prevailing in the host and home plants, respectively. The cost functions comprise both the fixed and variable costs. Following the works of Baniak *et.al* (2005), it is assumed that a single commodity market in a host country and that specific commodity is not produced in the host country. The price of this specific commodity is assumed to be determined by world price, P_w. Since foreign investment involves dealing in foreign currency, net expected returns on foreign investment must be weighted by probability of exchange rate fluctuation. Taking the zero-arbitrage condition, the equilibrium condition between domestic and foreign investment can be specified as (Udoh and Egwaikhide , 2008):

$$\mathbf{R^{f}(1\text{-}p) = R^{d}}$$

or,

$$\mathbf{(F^{R} - F^{c})\,(1\text{-}p) = D^{R} - D^{C}}$$

From this we can deduce that, the equilibrium condition is maintained when adjusted foreign expected returns equal to domestic expected returns. However, as stated in Udoh and Egwaikhide (2008), in real term, foreign investment will be more attractive if the net expected return on foreign investment weighted by appropriate index of exchange rate fluctuation is greater than the net expected returns on domestic investment. In general according to them any investment decision (investment in home or foreign country), investors inculcate the following variables.

$$\mathbf{F^* = F^*(F^R, D^R, p, F^c, D^C)}$$

Making totally differentiate this equation by holding adjustment costs constant and approximating the derivatives by first differences gives:

$$\Delta F^* = F_f^* \Delta F^R + F_d^* \Delta D^R + F_c^* * \Delta F^C + F_P^* \Delta P$$

From this equation we can understand that, the short run fluctuations in equilibrium foreign investment flows emanate from changes in gross expected returns on foreign and domestic investment. The adjustment cost is associated with foreign investment and exchange rate uncertainty (see Udoh and Egwaikhide, 2008)

For further explanation of the method, the works of Blen (2006) has put the conditions in the following ways and this study has taken directly the most related concepts from her study. In the fully deterministic case, profits created by the host country plant, expressed in domestic currency, are given by:

$$\mathbf{\Pi_{host}\,(Q) = (e)P_{world} \cdot Q - C_{host}Q - F_{host}}$$

Where $\mathbf{\Pi_{host}}$ denotes the profit of the host country; P_{world} represents world price of a specific commodity; Q denotes output of a firm; $C_{host}Q$ and F_{host} represent the variable and fixed cost prevailing in the host country, respectively; *e* denotes exchange rate of the foreign currency expressed as the number of units of foreign currency for one unit of local currency in the host country (see Blen, 2006).

Similarly, profits of the foreign plant, expressed in foreign currency as stated in Blen (2006) are:

$\Pi_{home}(Q) = P_{world} \cdot Q - c_{home}Q - F_{home}$

The prefix *home* represents home country. Here it is assumed that the profit function of the plant built in foreign country do not depend on exchange rate. From the above two equation, the net expected returns whether investing in home or foreign country in general depends on exchange rate, returns from investment and production costs. These variables depend on a number of macroeconomic conditions, political situations and institutional factors that happen in certain countries. The existence of exchange rate fluctuation, inflation, political instability, corruption in a country may raise the costs of doing business. How much these variables affect the inflow of FDI in Africa can be estimated in the following equation. However additional variables are included since they increase the robustness of the model.

Depending upon the literature and the model above, the study estimates the following equation:

$$RFDIGDP = \alpha_0 + \alpha_1 STDVINF + \alpha_2 STDVEX + \alpha_3 POLIST + \alpha_4 REDEBT + \alpha_5 GDPPC + \alpha_6 RTRGDP + \alpha_7 RLFT + \alpha_8 RR + \alpha_9 NR + \alpha_{10} RDOMCRGDP + \alpha_{11} PHONE + \varepsilon_t$$

Where: the dependent variable RFDIGDP represents is foreign direct investment inflow over gross domestic product (GDP). All the rest are explanatory variables.

STDVINF = standard deviation of inflation generated by taking variance from the monthly inflation rate of host countries and aggregated to annual frequency to relate it to the FDI model.

STDVEX = standard deviation of real exchange rate generated by taking the monthly exchange rate and aggregated to annual frequency.

REDEBT= ratio of total external debt of a host country to GDP.

RLFT= ratio of economically active labor force age from 15-64 to total population.

POLIST = political freedom indicators and institutional indicators measured on a one-to-six scale, with one representing the highest degree of political freedom and six the lowest. This variable is captured by state fragility index which is estimated by taking both the effectiveness and the Legitimacy indicators in four dimensions; Security, Political, Economic, and Social.

State Fragility Index = Effectiveness Score + Legitimacy Score (25 points possible)

Effectiveness Score = Security Effectiveness + Political Effectiveness + Economic Effectiveness + Social Effectiveness (13 points possible)

Legitimacy Score = Security Legitimacy + Political Legitimacy + Economic Legitimacy + Social Legitimacy (12 points possible).

In this study state fragility index is taken to measure both political instability and institutional strength towards corruption (for the detail see Marshall and Cole, 2010).

PHONE = number of telephones per 1,000 people

DOMCRGDP = domestic credit to the economy over GDP

GDPPC= GDP per capita, which is given by GDP divided by total population of the host country.

RTRGDP = ratio of value of total export and import of goods and services to GDP.

RR= the rate of return on investment (RR). It is captured by using log of the inverse of the real GDP per capita

NR= availability of natural resource.

The explanatory variables can be grouped in to different categories such as macroeconomic uncertainty indicators (STDVINF and STDVEX), domestic market size and infrastructure quality (GDPPC and PHONE), political freedom and host country institution indicator (POLIST), trade linkage (RTRGDP) and labor force availability (RLFT).

The real per-capita income growth (GDDPC) captures the size of the potential market for the foreign investors' products. It reflects the purchasing power of citizens in the host country. The size of the host country market can also represent the host country's economic conditions and potential demand for their output. Dunning (1991) proclaimed that getting market access is one of the reason to invest in the host county or serves as a mechanism selecting countries for foreign direct investment. This is because the market potential will increase the real return to capital and thus raise inflows of foreign direct investment (Dunning, 1991).This should be ascertained in recent world development report (2010) by indicating developed and middle income countries attracted substantial proportion of the total inflows relative to the low-income countries. Following the literature, the expected sign of market size which is proxied by GDDPC is positive.

The trade-to-GDP ratio variable captures the openness of the country to international trade and most studies referred this variable as a measure of trade restrictions. Investment in any country may require importing raw or semi-finished materials. The standard hypothesis stated that the high tariff rate (low values of Trade to GDP ratio) increases the costs of doing business and deters the inflow of FDI, meaning that a high value of this variable is an incentive to attract foreign businesses (Hufbauer *et al.* 1994). However, there are arguments stated that low value of this variable could help in attraction of horizontal FDI (see Caves, 1996).

It is believed that good infrastructure increases the productivity of investment and thus stimulates FDI attractions (Asiedu, 2002). In different studies, the level of infrastructure development in the host countries is captured by the number of telephones per 1000 population (see Asiedu, 2006). The argument here is that, availability and efficiency of telephone is crucial to facilitates communication among countries and creates good understanding of marketing channels (see Ajayi, 2004). Hence, this variable is expected to have a positive effect on the inflow of FDI. Borensztein *et.al* (1998) stated that infrastructure variable has brought positive effects like knowledge spillovers from FDI for instance through becoming local suppliers.

Natural Resource Intensity is another variable included in this study. The eclectic paradigm of Dunning stated that availability of desired natural resource in the host country, all else equal, attracts more FDI than non-resource country. Asiedu (2002) noted that omission of this variable in estimating the model may cause the estimates to be biased. We therefore include the share of minerals and oil in total exports to capture the availability of natural resource endowments. The real experience of Africa as stated by Ajayi (2004) indicates countries which have natural and mineral resources as well as large markets attract more FDI. He stated that Africa countries have not only large reserves of oil, gold, diamonds and copper, but also more than half of the world's cobalt and manganese, one-third of bauxite, and more than 80% of chromium and platinum. Furthermore, Ajayi provide the evidence that number of countries, including Angola, Nigeria, Côte d'Ivoire, Botswana and Namibia have been host to FDI because of this advantage. This posited that the expected sign of Natural Resource is positive.

The real debt which is proxied by the ratio of debt to GDP of host country is also included in this study. Lemi and Assefa (2006) stated that investor confidence is expected to be high if that country has low debt burden. Since according to them, government may impose huge tax in order to pay back the debt and this will erode the confidence investing in the host country. The sign of this variable is expected to be negative.

Domestic credit to the private sector (RDOMCRGDP) is used as an indicator of financial market development. Financial development is important for FDI inflows. A well-developed financial market is known from available evidence to enable a country to tap the full benefits of FDI. Alfaro *et.al* (2001), using cross-section data, find that poorly developed financial infrastructure can adversely affect economy's ability to take advantage of the potential benefits of FDI. It is expected to have positive effect on FDI flows.

Labor force availability is one of the location advantage posited in eclectic paradigm of international investment. It is proxied by ratio of economically active labor force, age from 15-64 to total population (*RLFT*). The sign of labor force availability (*RLFT*) is expected to have positive effect on FDI inflows (see Lemi and Assefa, 2009).The last variable included in this study is cost of capital. It is proxied by rate of return (RR) of capital by using log of the inverse of the real GDP (see Blen, 2006).

3.2 Data and Econometric Techniques

Sample countries are selected based on availability of all data included in this study. Fortunately, selections of countries comprise all regions of Africa and this helps to give inference for all African countries. The analysis covers the time span from 1995-2009. Monthly exchange rate and inflation rate data are taken from Financial Statistics of International Monetary Fund (IMF). The variables used in this study are annual in frequency and standard deviation of the twelve month exchange rate and monthly inflation rate are represents annual data. The data on political instability index is found from freedom house country ratings. Economically active labor force and total population data are taken from ILO database. Data on real GDP, FDI, export and import, debt ratio, domestic credit and natural resource have been found from World Bank Development Indicators. Export amounts of minerals and oil is used to measure natural resource.

4. DIAGNOSTIC TESTS AND DATA ANALYSIS

4.1 *Diagnostic Tests*

Before applying any model in order to get parsimonious model that fit to the specific study and to have robust results, the relevance of that model must be examined from theoretical and empirical perspective and this can be called as diagnostic tests. In this paper several econometric tests are undertaken and have been dealt with the bias.

a) Hausman Specification Test

This study analyses the net inflow of FDI from all source countries to the selected 25 host countries in Africa. In order to capture country specific effects the study employs panel data techniques. Fixed or random effects panel data models take the country-specific heterogeneities of these countries into account. Still there are some differences between Fixed and Random effect model. The fixed effects model is simply a linear regression model in which the intercept terms vary over the individual units, *i, and* consider the country-specific effects as regressors rather than including them to the error term, thereby reducing omitted variable bias (Verbeek, 2003). In the Random model the intercept terms have not been included as regressors, can be appropriately summarized by a random error term.

The specification test devised by Hausman (1978) is used to determine whether a fixed effect model or a random effect model is more appropriate. The test mainly examines whether there is correlation between regressors and the intercept term. In this study the

Hausman specification test is used to choose between the fixed effects and the random effects model. Under the null hypothesis, the Hausman test assumes no correlation among the intercept and the independent variables. The rejection of the null hypothesis implies that the appropriate model is the Randon effect model. In this study Hausman specification test is applying to distinguish between Fixed and Random effect model. The result of the specification test confirmed Fixed model is more appropriate. Beside the selection of Fixed effect estimates, this study employs Arrelano-bond GMM dynamic panel model *(Panel Generalized Method of Moments at first difference)*. See the tests in appendix 2.

b) Heteroskedasticity

Baltagi (2001) has noted that assuming homoskedastic disturbances when heteroskedasticity is present will produce consistent estimates of the regression coefficients, but these estimates will not be efficient. Also, the standard errors of these estimates will be biased unless one computes robust standard errors correcting for the possible presence of heteroskedasticity (Baltagi, 2001; 77). This study employs Brush-Pagan test of heteroskedasticity to detect this problem. Under this test the null hypothesis of the variance of the error term is homoskedastic while the alternative is heteroskedasticity of the error term. First the method estimates the square of the residual of the random effect model. The test statistics can be computed by multiplying R^2 of an auxiliary regression that is obtained from regressing the square of the residual on the explanatory variables by N(T-1). The test statistics follow a Chi-square distribution with

J degrees of freedom where J represents the number of explanatory variables used in auxiliary regression.

In this study the computed test statistic is greater than the tabulated value at 5% level of significance implies that rejection of the null hypothesis and we can conclude that there is heteroskedasticity problem (see ANNEX 3 for the detail).

c) Panel Unit Root Test

It is better to test stationarity of variables before estimating the regression of an equation; otherwise it may leads to spurious analysis. Panel unit root tests are similar but not identical to unit root tests carried out in time series analysis. There are different kinds of panel unit root test statistics. In this study Levin, Lin and Chu (LLC) test is used to check the stationarity of the variables in the model. LLC suggested a test for unit root for panel data model with fixed effects, individual deterministic trends and heterogeneous serially correlated errors and this test mechanism requires strongly balanced data. Since the data of this study are strongly balanced, it is possible to take LLC. The null hypothesis entails that each individual time series contains a unit root and the alternative is assumed each time series is stationary (see, Baltagi, 2001).

The results of this study show all the variables are stationary at level. The detail of the results is shown in ANNEX 4.

4.2 *Discussion of Results*

4.2.1 The Fixed Effect Results

The Fixed effect results of the study are presented in table 4.1. In this study, macroeconomic uncertainty is captured by unconditional exchange rate volatility and unconditional inflation; simply takes standard deviation of exchange rate and standard deviation of inflation. The report indicates that volatility of inflation adversely affects FDI inflows to Africa; it is statistically significant at one per cent level of significance with its expected sign. Simply it indicates that a high rate of inflation can signal macroeconomic instability thereby decreasing FDI inflows. On the other hand the data could not support volatility of exchange rate has impact on FDI inflows in the continent. Furthermore the study has taken the square of the Standard Deviation (Variance) of exchange rate to investigate what relationship could happen if volatility would increase by squared value. Although the study assures that there is insignificant relationship exists between the two, the expected sign meet as expected in case of Variance of exchange rate. Most African countries apply managed floating exchange rate system can be taken as the reason of the insignificant impact on FDI inflows. The coefficient of the political instability dummy has negative sign in all regressions; however it is statistically insignificant in affecting of FDI inflows to the continent. The sixth dummy variable, high political instability is dropped from the study because of perfect multicollinarity, but the concept can be captured by the remaining dummies. The reason could be most inflows of FDI are emanates from East Asian countries which basically do not request good governance system as a pre-condition for their capital flows (see Mulat, 2009 and

Alemayehu, 2006). Rather they use alternative actions and sometimes they require long live government to secure their investment.

Table 4.1

Regression Results Under Fixed Effect Model

Dependent Variable: Ratio of FDI to GDP, FDI Inflow, 1995-2009

Independent Variables	***Coefficient Robust***	***Robust Std. Err.***	***t-ratio***	***P-Value***
STDVINF	-0.0000523	8.70E-06	-6.01***	0.000
STDEX	0.0000409	0.0000656	0.62	0.539
VOLEX	-6.28E+00	1.06E-07	-0.59	0.558
GDPPC	0.000151	0.000035	4.32***	0.000
REDEBT	-0.0001676	0.0074222	-0.02	0.982
RTRGDP	0.0648886	0.0506714	1.28	0.213
RLFT	-0.000645	0.0022588	-0.29	0.778
RR	0.0063385	0.0036752	1.72*	0.097
RDOMCRGDP	-0.0000159	0.0002461	-0.06	0.949
PHONE	0.0002067	0.0001058	1.95*	0.063
NR	-0.0058112	0.0277449	-0.21	0.836
Dummypolist2	-0.0139684	0.0277449	-0.44	0.662
Dummypolist3	-0.0287819	0.0258743	-1.11	0.277
Dummypolist4	-0.0293443	0.0232469	-1.26	0.219
dummypolist5	-0.0321405	0.0227491	-1.41	0.171
Constant	0.0141296	0.0286173	0.49	0.626

Number of Observation = 375
number of groups = 25

R^2 within = 0.1907

R^2 between = 0.0615

R^2 Over all=0.0847

Prob>F = 0.0000

****** significant at 1%, ** significant at 5%, * significant at 10%***

Beside uncertainty indicators, table 4.1 indicates other variables are included as regressors. This is because they increase the robustness of the estimates. The market size variable and as well as growth variable indicator (GDP per capita, GDPPC) play a significant role in FDI promotion and it is statistically significant even at one percent significance level. The result further indicate that coefficient of the infrastructure variable (PHONE) is positive and significant at 10 percent significance level. This entails that having good infrastructure in one country could be considered as an incentive for foreign investment inflows. Even if most theories direct that availability of natural resource in a certain country attract more FDI, the coefficient of the estimated result shows negative sign although the result is statistically insignificant. However, there are some reasons which indicate availability of natural resource in a country play disincentive effect on FDI inflows. Unstable inflation is one among them. The reason as stated in Asiedu and Lien (2011) is based on the idea that resource booms has brought appreciation of local currency. This makes to the country's exports less competitive at world prices, and thereby crowds out investments in non-natural resource tradable sectors. If the crowding out is beyond one-for-one base, it may lead to an overall decline in FDI (Asiedu and Lien, 2011; 104). Since this paper assures that inflation has a serious disincentive on FDI inflows, it helps to give some confirmation with this regard. The other reason stated by Mabikke (2012) is most resource rich countries of Africa are characterized by weak governance, outdated laws and weak institutional capacity and this affects the confidences of multinational companies on their future returns. Strong legal and political institutions are required for the development of any country otherwise the cost associated with the development is much higher than the benefit gain (see Mulat, 2009). The coefficient on rate of return of capital which is proxied by log of the inverse of GDP (RR) has positive impact on FDI inflows and it is statistically significant at 10 percent significance level. In this, Fixed Effect estimates the ratio of trade to GDP (RTRGDP) or in other word openness of a country has positive sign as expected, although not statistically significant. Even though the coefficient of real debt (RDEBT) is negative according to prior expectation, the data do not support to accept its impact statistically.

The coefficient on financial sector development proxied by domestic credit to the economy (RDCRGDP) is negative. The capital scarcity proposition here can be considered as the reason for this finding (see *Udoh et.al, 2008).* According to the proposition, developing countries that experience inadequate domestic capital due to the low saving capacity is the main rationale for foreign capital flows to those countries. Financial sector development in this study is statistically insignificant which means it does not bring any strong impact on FDI inflows. The results show that the availability of labour force in a country is negative; however its effect is statistically insignificant. Different studies indicate that availability of labour force in a given country plays a role in the attraction of foreign capital. On the other hand others argue that labour force must be literate. This is because foreign investment has brought capital and technology and this requires educated persons for the effective manipulation of the technology (see Adugna and Sisay, 2001).

4.2.1. Arrelano-Bond GMM Dynamic Panel Results

Beside fixed effect estimates, this study also applies regressions by using generalized method of moments (GMM), specifically the Arellano-Bond GMM dynamic model. The main justification on the one hand is Foreign Direct Investment corresponds to a dynamic process. On the other hand, the Arellano-Bond GMM dynamic panel estimator addresses the problem of autocorrelation of the residuals, as the lagged dependent variable is included as an additional regressor, and deals with the fact that some of the control variables are endogenous. The use of GMM allows correcting for insufficiencies related to problems of simultaneity bias, inverse causality and omitted variables (Kpodar, 2005).This estimator often referred to as the "difference" GMM estimator takes the first difference of the data and then uses lagged values of the endogenous variables as instruments. Here, two lagged independent variables are taken.

According to the result, the two lagged time value of the endogenous variable is statistically significant at 1 percent significance level. The positive sign of the coefficient indicates that previous time foreign investment give clue for the growth of current FDI inflows; history has matter. Like Fixed effect this dynamic model results also asserts that macroeconomic volatility which is proxied by standard deviation of inflation rate discourages FDI inflow to Africa though here its significance level is 5 percent.

Table 4.2

Regression Results of First Difference GMM Dynamic Model

Dependent Variable: Ratio of FDI to GDP, FDI Inflow, 1995-2009

Independent Variable	*Coefficient*	*Standard Error Robust*	*t-value*	*p-Value*
RFDIGDP L1	0.1777166	0.1396176	1.27	0.203
RFDIGDP L2	0.1663933	0.0484088	3.44***	0.001
STDVINF	-0.000205	0.0000997	2.06**	0.04
STDEX	0.0000332	0.0000857	1.27	0.698
VOLEX	-3.59E-08	1.41E-07	-0.25	0.799
GDPPC	0.0002506	0.0001065	2.35**	0.019
REDEBT	0.0172598	0.0106079	1.63	0.104
RTRGDP	0.1179806	0.0644134	1.83*	0.067
RLFT	-0.0050227	0.0035589	-1.41	0.158
RR	0.0118825	0.0052892	2.25**	0.025
RDOMCRGDP	0.0001509	0.0004038	0.37	0.709
LNPHONE	0.0245426	0.0111765	2.2	0.028
NR	-0.0508176	0.0296451	-1.71*	0.086
Dummypolist2	-0.0238136	0.0315502	-0.75	0.45
Dummypolist3	-0.0282932	0.0337634	-0.84	0.402
Dummypolist4	-0.0322316	0.0284112	-1.13	0.257
dummypolist5	-0.0285455	0.0245689	-1.16	0.245
Constant	-0.0758643	0.0545564	-1.39	0.164

Number of observation = 300
Number of groups= 25

Prob> chi. Square = 0.0000

****** indicates significance at 1%, ** significance at 5%, * significance at 10%***

However, this strengthens the idea that inflation creates a serious problem on foreign capital inflows. The variable, GDP per-capita also significant and positive as fixed effect estimates. Here the infrastructure variable is proxied by natural logarithm of number of telephones within 1000 square km area is statistically significant and the coefficient is positive. The coefficient on capital return, RR is positive and significant at 5 percent significance level. New things here, in the dynamic model is two variables; proxy of natural resource and ratio of trade to GDP (trade openness) have impact on FDI in the continent. However, they are statistically significant only when we take 10 percent significance level. The coefficient on Natural Resource is negative while the coefficient on trade openness is positive as fixed effect estimates. The illustration is basically the same as Fixed Effect estimates, above.

5. CONCLUSION AND POLICY IMPLICATION

5.1. *Conclusion*

Over the last two decades there is unprecedented inflow of FDI to Africa. However, comparing to other developing countries FDI inflows to Africa still remain small. In most cases FDI is considered one of the development opportunity since it has brought capital and technology which augments and facilitate development in a country. To achieve better development through FDI it is better to identify first the deterrent factors that inhibit FDI inflows to Africa. Different studies suggest that macroeconomic uncertainty and poetical instability among other determinant factors affects FDI in the continent. This study examines how uncertainties affect FDI in Africa. A few studies are undertaken by different authors but most of them are done in disaggregated form, either macroeconomic volatility or political instability. Studies conducted by Lemmi and Assefa (2009) and Blen (2006) incorporate both political and macroeconomic uncertainties in their investigations. Only 11 countries are selected as a sample in Blen study and Sisay and Adugna addresses this issue on data took before ten years ago. This study has contribution to provide current information that based on derivation of macroeconomic uncertainty from unconditional volatility and state fragility index is taken to examine political instability and institutional strength. To do this, we employ both panel Fixed Effect model and Arellano-Bond GMM dynamic panel model.

The results of the two models show that macroeconomic uncertainty which is proxied by volatility of inflation has a deleterious impact on FDI inflow both in Fixed Effect results and dynamic model results. Variables like GDP per-capita, infrastructure, capital returns are statistically significant in the two models, Fixed Effect and Arellano-Bond GMM dynamic panel model. Only in the dynamic model Natural Resource and Trade Openness have effect on FDI in Africa although they are significant at 10 percent significance level. Other economic factors such as Volatility of Exchange rate, Labor, Domestic credit, and Real Debt Ratio are insignificant in affecting FDI flow to African economies.

The result asserts that sound macroeconomic policy especially on inflation, registering high growth or per- capita income and development of infrastructure are important factor for FDI inflows to Africa.

5.2 Policy Implication

The study reveals that volatility of inflation in Africa has strong impacts on FDI inflows. To tackle down its effect, countries should apply sound macroeconomic policy. Furthermore, they should examine their fiscal policy, their management of money supply and foreign economic policy. Most African countries are in the process of economic development; however most of them have poor macroeconomic management; excess government expenditure and often they use printing of money to finance their deficit. Hence, these processes could create inflation and so affects FDI inflows. On the other hand, the lack of capital and technology availability in Africa requires foreign capital inflows since FDI has brought the things that African has not. Meaning, development processes should incorporate the role of FDI in the economy rather depending on domestic investment alone.

The study also pointed out that market size is important significant variable for FDI promotion. Availability of more number of populations does not mean that more market of goods and services. In other words to make peoples to buy more goods and services their income level should have increased, at least. This study gives justification that per-capita income is significant and important for FDI inflows. Thus appropriate economic policy that should help to increase per-capita income is very necessary. However caution should be taken weather this policy brings unintended inflation.

When we discuss issues on FDI, it is important to see the situations of other developing countries especially some Asian countries which have better experiences on FDI inflows. Without considering determinants of capital flow to the rest of the world, studying and designing new policy that seems relevant on African countries only could not make strong African to bring solutions. Since FDI is a world phenomenon and movement, drawing lessons from other countries experience is very crucial.

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ANNEXES

ANNEX 1: LIST OF NUMBER OF COUNTRIES IN THE SAMPLE

Angola	*Morocco*
Burkina Faso	*Mozambique*
Burundi	*Niger*
Cameroon	*Nigeria*
Cote d'Ivoire	*Senegal*
Egypt, Arab Rep.	*South Africa*
Ethiopia	*Sudan*
Gambia, The	*Tanzania*
Ghana	*Togo*
Kenya	*Tunisia*
Malawi	*Uganda*
Mali	*Zambia*
Mauritius	

ANNEX 2: Housman Specification Test
Hausman fixed_effectsrandom_effects

	Coefficients (b) fixed_effe~s	(B) random_eff~s	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
stdvinf	-.0000523	-.0000468	-5.44e-06	.
stdvex	.0000409	.0001029	-.000062	.0000999
volex	-6.28e-08	-1.33e-07	7.03e-08	1.56e-07
gdppc	.000151	.0001621	-.000011	.0000149
redebt	-.0001676	.0053845	-.0055521	.002711
rtrgdp	.0648886	.0498717	.0150169	.0116336
rlft	-.000645	-.003952	.003307	.0014265
rr	.0063385	.0096566	-.0033181	.0021985
rdomcrgdp	-.0000159	.000029	-.0000449	.0001746
phone	.0002067	-.0000744	.000281	.0001016
nr	-.0058112	.0248879	-.030699	.013392
dummypolist2	-.0139684	.0031057	-.0170742	.0151711
dummypolist3	-.0287819	-.0186662	-.0101157	.0117941
dummypolist4	-.0293443	-.0148306	-.0145137	.0070941
dummypolist5	-.0321405	-.0225688	-.0095718	.0044559

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(13) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 21.07
Prob>chi2 = 0.0716
(V_b-V_B is not positive definite)

ANNEX 3: Heteroskedasticity Test

```
. reg uifixed2 stdvinf stdvex gdppc redebt rtrgdp rlft rr rdomcrgdp phone nr miga dummypolist2 dummy
> polist2 dummypolist3 dummypolist4 dummypolist5 dummypolist6 volex
note: dummypolist2 omitted because of collinearity

      Source |       SS       df       MS              Number of obs =     348
-------------+------------------------------           F( 17,   330) =  478.80
       Model |  .003655738    17  .000215043           Prob > F      =  0.0000
    Residual |  .000148213   330  4.4913e-07           R-squared     =  0.9610
-------------+------------------------------           Adj R-squared =  0.9590
       Total |  .003803952   347  .000010962           Root MSE      =  .00067

------------------------------------------------------------------------------
    uifixed2 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     stdvinf |   1.93e-07   2.39e-07     0.81   0.419    -2.77e-07    6.63e-07
      stdvex |   4.37e-07   1.99e-06     0.22   0.826    -3.47e-06    4.35e-06
       gdppc |  -1.48e-06   9.90e-07    -1.49   0.137    -3.43e-06    4.71e-07
      redebt |   .0003852   .0000864     4.46   0.000     .0002154    .0005551
      rtrgdp |  -.0003603   .0001657    -2.17   0.030    -.0006863   -.0000343
        rlft |  -.0001489   .0000661    -2.25   0.025     -.000279   -.0000189
          rr |  -.0001417   .0000786    -1.80   0.072    -.0002964     .000013
   rdomcrgdp |   .0000121   2.03e-06     5.98   0.000     8.14e-06    .0000161
       phone |  -2.62e-06   2.06e-06    -1.28   0.203    -6.67e-06    1.42e-06
          nr |   .0006761   .0001645     4.11   0.000     .0003525    .0009998
        miga |  -.0013597   .0002093    -6.50   0.000    -.0017714   -.0009479
dummypolist2 |  -.0165435   .0004293   -38.53   0.000     -.017388   -.0156989
dummypolist2 |  (omitted)
dummypolist3 |  -.0163441   .0004385   -37.27   0.000    -.0172067   -.0154815
dummypolist4 |  -.0168043   .0004453   -37.73   0.000    -.0176804   -.0159282
dummypolist5 |  -.0164573   .0004764   -34.54   0.000    -.0173945   -.0155201
dummypolist6 |  -.0164137    .000494   -33.22   0.000    -.0173856   -.0154419
       volex |   5.43e-09   4.74e-09     1.15   0.253    -3.90e-09    1.48e-08
       _cons |   .0179952   .0005781    31.13   0.000     .0168579    .0191325
------------------------------------------------------------------------------
```

dis 0.9610*25*14 = 336.35

ANNEX 4: Panel Unit Root or Stationarity Test

```
. xtunitroot llc    rfdigdp, trend

Levin-Lin-Chu unit-root test for rfdigdp
----------------------------------------
Ho: Panels contain unit roots                 Number of panels  =     25
Ha: Panels are stationary                     Number of periods =     15

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 7.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         -12.0036
 Adjusted t*           -3.1393       0.0008
------------------------------------------------------------------------------

. xtunitroot llc    stdvinf, trend

Levin-Lin-Chu unit-root test for stdvinf
----------------------------------------
Ho: Panels contain unit roots                 Number of panels  =     25
Ha: Panels are stationary                     Number of periods =     15

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 7.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         -98.8637
 Adjusted t*          -94.8749       0.0000
------------------------------------------------------------------------------

. xtunitroot llc     stdvex, trend

Levin-Lin-Chu unit-root test for stdvex
---------------------------------------
Ho: Panels contain unit roots                 Number of panels  =     25
Ha: Panels are stationary                     Number of periods =     15

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 7.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         -12.4684
 Adjusted t*           -3.8751       0.0001
------------------------------------------------------------------------------
```

```
. xtunitroot llc      gdppc, trend

Levin-Lin-Chu unit-root test for gdppc
------------------------------------------------
Ho: Panels contain unit roots            Number of panels  =     25
Ha: Panels are stationary                Number of periods =     15

AR parameter: Common                     Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 7.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -16.2164
 Adjusted t*         -13.0189        0.0000
------------------------------------------------------------------------------

. xtunitroot llc      redebt, trend

Levin-Lin-Chu unit-root test for redebt
------------------------------------------------
Ho: Panels contain unit roots            Number of panels  =     25
Ha: Panels are stationary                Number of periods =     15

AR parameter: Common                     Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 7.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -12.4931
 Adjusted t*          -3.7654        0.0001
------------------------------------------------------------------------------

. xtunitroot llc      rtrgdp, trend

Levin-Lin-Chu unit-root test for rtrgdp
------------------------------------------------
Ho: Panels contain unit roots            Number of panels  =     25
Ha: Panels are stationary                Number of periods =     15

AR parameter: Common                     Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 7.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -12.7469
 Adjusted t*          -2.7207        0.0033
------------------------------------------------------------------------------
```

```
. xtunitroot llc   rlft, trend

Levin-Lin-Chu unit-root test for rlft
---------------------------------------------
Ho: Panels contain unit roots              Number of panels  =     25
Ha: Panels are stationary                  Number of periods =     15

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 7.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                      Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         -12.9346
 Adjusted t*           -8.1830        0.0000
------------------------------------------------------------------------------


. xtunitroot llc  rr, trend

Levin-Lin-Chu unit-root test for rr
---------------------------------------------
Ho: Panels contain unit roots              Number of panels  =     25
Ha: Panels are stationary                  Number of periods =     15

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 7.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                      Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         -17.3066
 Adjusted t*          -14.2637        0.0000
------------------------------------------------------------------------------

. xtunitroot llc   rdomcrgdp, trend

Levin-Lin-Chu unit-root test for rdomcrgdp
---------------------------------------------
Ho: Panels contain unit roots              Number of panels  =     25
Ha: Panels are stationary                  Number of periods =     15

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 7.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                      Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t          -8.7547
 Adjusted t*           -1.7052        0.0441
------------------------------------------------------------------------------
```

```
. xtunitroot llc  nr, trend

Levin-Lin-Chu unit-root test for nr
-----------------------------------
Ho: Panels contain unit roots                 Number of panels  =     25
Ha: Panels are stationary                     Number of periods =     15

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 7.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t       -12.0584
 Adjusted t*         -4.2597        0.0000
------------------------------------------------------------------------------
```

Declaration

I, the undersigned, declare that this project is my original work and has not been presented for a degree in any other university, and that all sources of materials used for the study have been duly acknowledged.

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