ACCESSES IN DETERMINING FOREIGN DIRECT INVESTMENT: PANEL DATA ANALYSIS OF SUB-SAHARAN AFRICA COUNTRIES

GETACHEW MELESE

A project submitted to
Department of Economics

Presented in partial fulfillment of the requirements for the Degree of
Master of Arts in Economics (Applied Trade Policy Analysis)

Addis Ababa University
Addis Ababa, Ethiopia
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ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

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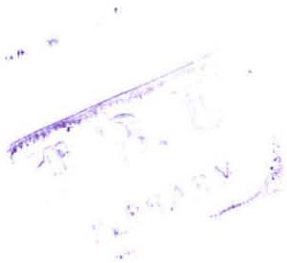

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ABSTRACT

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More recently, due to the globalization process and the increasing roles of Multinational Corporation in economic development, many empirical literatures have been trying to take into account the effects of not only the classical factors: but also the various institutional issues which affect considerably the FDI flow in the host countries . So, the objective of this paper is to explore the major accesses to FDI flow to the Sub Saharan Africa countries by focusing on main institutional factors, and other conventional variables in FDI flow to the region. For this purpose, we employed two panel model techniques: the fixed effect and dynamic panel model (the system GMM estimator of Arellano and Bover (1995) and Blundell and Bond (1998)) by utilizing the data of 32 SSA countries covering the period 1994-2010. Our findings reveal that among the institutional quality variables (regulatory quality), past level of inward FDI, market size, openness, natural resource availability, financial development if supported by regulatory quality are found to be important derivers of FDI flow to the region. Conversely measures in control of corruption, the existing rule of law, macroeconomic condition (i.e. inflation and exchange rate) and infrastructural situation are found to be insignificant for the region's FDI flow. To increase FDI flow to the region policy makers (economic administers) of the region need to strive to improve and amend their policy regarding their institutions: rule of law, the way to control corruption, develop infrastructures, improve macroeconomic condition and should diversify and develop their economies.

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List of Acronyms

ADB	Africa Development Bank
ADF	Augmented Dickey-Fuller
BRICKS	Brazil, Russia, India, China and South Africa
ECA	Economic Commission for Africa
FDI	Foreign Direct Investment
GDF	World Development Finance
GDP	Gross Domestic Product
GDPPC	Gross Domestic product per capita
GLS	Generalized Least Square
GMM	Generalized Method of Moment
IMF	International Monitory Fund
LDC	Least Developed Countries
MNC	Multinational Company
IPS	Im, Pesaran and Shin
ODE	Overseas development assistance
OECD	Organization for Economic cooperation and Development
OLI	Ownership location and International advantage
OLS	Ordinary Least Squares
REER	Real effective exchange rate index
SSA	Sub Saharan Africa Countries
UNCC	UN Conference Centre
UNCTAD	United Nation Conference on Trade and Development
UNDP	United Nation Development Program
UNECA	United Nation Economic Commission for Africa
USD	United States Dollars
VIF	Variance inflation factor
WBADI	World Bank Africa Development Indicators
WBWDI	World Bank World Development Indicators
WDI	World Development Indicator
WGI	World Governance Indicator
WTO	World Trade Organization

Chapter I

Introduction

1.1 Background of the Study

Foreign Direct Investment (FDI) is one of the most important sources of capital for developing countries. It has become an engine of employment, productivity improvement through management spillover, it is the main conduit through which technology transfer takes place. The transfer of technological spillovers shows the way to an increase in the quality of factor productivity, efficiency in the utilization of resources which leads to growth. FDI has now become potential source of growth; it is increasingly important and strongly believed to have a major role to play in the economic development of developing countries (Hadjila, 2010, Azam etal, 2011).

It is often claimed that FDI is an important source of capital, that it complements domestic investment, it is one of the most vital and dynamic international resource flows, which provides package of financial capital, goods and service that can make the economy more competitive in the international market. As a source of external capital to enhance growth, FDI has become extremely important in light of the decreases in official lending to the developing world as a whole, it has been overcoming overseas development assistance in terms of size (Leonard, 2005, Tajul et al, 2010, Abbi et al, 2011).

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As a result of the potential role of foreign direct investment in enhancing growth and economic transformation, many developing and transition countries seek to capture such investments to accelerate their development efforts. Promoting and attracting FDI has therefore become a major component of development strategies for these countries. Because of this; all countries have made a great struggle to attract greater amounts of FDI inflows to their nations for the past decades. This competition may explain how FDI flows significantly around the world and lift its concentration only in developed nations. But this does not mean that all countries have been benefiting and succeeding equally.

Recent UNCTAD (2010) report shows that the total world FDI inflows have grown tremendously from an annual average of US$ 470 billion during the period 1990-2000 to over US$ 1.3 trillion in the period 2001-2010 reaching a record US$ 1.9 trillion in 2010. FDI distribution across the regions varies differently based on structure of the world economises, in which the large share of it has been flown to the developed economics (America, Europe, Asia and Oceania), the new developing economies like the BRICKS (Brazil, Russia, India, China and South Africa) and other emerging countries. Accordingly, annual average of 70 percent of the world FDI shares received by developed countries over the past decades whereas developing countries excluding LDC attracted an estimated 23 percent of the world FDI inflow.

Meanwhile Foreign direct investment (FDI) flows to Africa increases considerably over the last decades despite some fluctuation, the region attracted an average of 99 billion over 1990-2000 and 317 billion over the period 2000-2010. But the available evidences confirm that Africa has been receiving the lowest share of global FDI over time and its share of FDI in developing countries has declined overtime. On average the size of FDI to the continent turns down from about 13.6% over 1980-1990 to 3.1% over 1991-2000 and 3.3% over 2001-2010. Surprisingly out of this share almost 75 percent of the total FDI flows directed to 15 out 54 African states, which are more endowed with oil and mineral. The situation has become more overwhelming for those nations which most of them situated in Sub-Saharan African region (see appendix-B tables 1 and 3 for more detail).

FDI flow to the Sub-Sahara African (SSA) comparatively has increased since the start of 1990s. According to the World Investment Report (UNCTAD, 2010), the value of foreign direct investment to the region increased on average from US$33.7 billion over the period 1990-1995 to US$92.5 billion during 2001-2005. Despite some fluctuation during 2006-2010, it has also reached a level of US$176.3 billion over this period. In terms of the contribution to the region's gross domestic product, the report also shows some noticeable improvement. The FDI/GDP ratio progressively increased on average from 10.6 percent over the period 1980-1990 reaching a level of 30 percent over a period 2000-2010. The achievement of attracting FDI comparing to previous period to some extent is encouraging and shows the region's bright future in FDI inflow.

However, the increment of FDI in SSA over these periods comparing to other regions is not so significant. For example, FDI in the region grew by 96.6 percent over the period 2005-2010.This increment can be compared with other regions of developing countries. In similar period, that rise is lower than 172% increase of FDI in the Caribbean countries, 239% in South Asian countries, 291% in Western Asian countries and 166% in Oceania countries (see appendix- B tables 1 and 2).

In addition, there have been seen a growing differentiations among the SSA countries in terms of their attractiveness to FDI. Recent UNCTAD (2010) report shows that bulks of SSA's FDI stocks are concentrated in some sectors and a small number of countries for the past decades. This has not changed till now, for instance, over a period spanning from 2005 to 2010 almost 65 percent of FDI has flown primarily to four resource reach and economically more advanced SSA countries. South Africa alone hosting more than 38 percent; Nigeria 16 percent and the remaining inflow of FDI stock shared by Angola and Sudan, all but South Africa are oil exporting countries. In contrast, inflows of FDI to other SSA countries with small economies, unused exploitable natural resources and low per capita incomes remained insignificant. Over the same period forty-five countries of the SSA countries, almost 90 percent of the region received less than 35 percent of the total FDI flow to SSA (see appendix-B table 3). This significant difference in FDI flow reflects that still natural resource (specifically oil and mineral) driven FDI dominated rather than other types of foreign direct investments flows to the region over the last decades.

As whole, FDI flows to the SSA are still very low in absolute terms. As per the report described above, the region still lags far behind in terms of attracting FDI compared with other developing countries. Despite the region is endowed with rich and relatively untapped natural resources, and number of efforts have been made in the past to boost FDI flows to the region such as improving investment and business climate, better macroeconomic condition, greater economic liberalization, privatization, domestic and foreign market accesses, ensuring peace and stability and the likes but they have not had any significant impact and the expected surge of FDI inflow into the sub region has not occurred. This consolidates the idea suggested at different times, that many developing countries, including the Sub-Saharan African countries, have attracted only small amounts of foreign direct investment (FDI) despite improving their policy frameworks and

their efforts at economic liberalization in an increasingly globalizing world. Moreover, FDI inflows are highly concentrated in a small number of countries. These indicate that efforts have been unsuccessful; they have not still lifted the underlying constraints on FDI to the region, and failed to confront the challenges to the attraction of FDI to the region posed by the globalization process (Asiedu, 2004, ECA, 2005, UNCTAD, 2009).

So, what do the theoretical and empirical literatures say about the determinant of FDI? Are all these factors workable in African context or what other measures should be taken? More recently, due to the globalization process and the increasing roles of Multinational Corporation (MNSs) in economic development, many empirical researchers have been trying to take into account the effects of not only the classical factors: infrastructural development, openness to foreign investment, market accesses but also the various institutional factors which are more dedicated to point out issues related to policy transparency, extended political and economic freedom, regulatory quality, conducive environment for business and investment, corruption, rule of law, political risk etc. which affect considerably the FDI flow in the host countries . Thus, investigating these fundamental factors is important to understand the FDI flow to the Sub-Saharan African countries, and help to take possible policy options in the future. So in this connection this research thesis/project tries to focus on the major accesses to FDI flow to the region by giving more emphasis on major institutional quality in FDI flow to the region. Focusing on this issue only, does not mean that other factors included in theory of FDI are not considered; they will be scanned in the literature part and integrated with the empirical model.

1.2 Statement of the Problem

Sub Saharan African is one of the poorest region in which among the 20 poorest countries in the world, 16 are found in this region. The economic performance of the region is poorer than any region in the world (Levine et al, 1995). The average annual growth rate of real GDP per capita which was -0.9 percent over the period 1975-84 rose to 0.7 percent over the period 1995-2002, following global crises it has declined to 0.4 percent in period 2008-2009, at the end of 2009 the region showed a global recovery, the GDP growth boosted to 4.2 per cent in 2010 (UNAEC, 2005, WDI, 2011). However despite some progress made in the past, it has been far from

meeting to bring sustainable development and eradicate poverty in the region, which remains the overarching goal of development policy in Africa.

Public or domestic private investment should have been, therefore one of a very essential requirements to get rid of poverty through economic growth and development in most countries of Sub-Saharan Africa region. But, the region is still far from meeting their investment needs from domestic resources due to weak economy that have resulted in low saving rate and widened resource gap. The available data indicate that in Sub-Saharan Africa gross domestic savings as a percentage of GDP fell from 20.1 percent over the period 1980-89 to 15.4 percent in the period 1990-99 and has remained 16 percent until the period 2000-09 (WBADI, 2011). Furthermore, over the past period, the region's exports as percentage of GDP, which are dominated by primary commodity, has not shown significant change, it was 26.9 percent in period 1980-89 and rose to 27.2 percent in period 1990-99 but further declined from 36 percent in 2008 to 29.8 percent in 2009 (WBADI, 2011). The region's share of world exports fell from 3.1 percent in 2003 to 2.3 percent in 2009 (WTO, 2010).

These entire glimpses that the existing economic condition of the region could not finance the investment projects demand for huge capitals unless they are funded by overseas development assistance (foreign aids or borrowing). Overseas development assistance (ODA) accounted for as much as 53 per cent of the total net external resource flows to SSA as late as 1996 (Ademola, 1999). However, following the 2008 global crises, there are still uncertainties in the economic condition of the world. That is the sovereign debt crisis in some European countries and the slow economic growth in other advanced countries have been contributing to a fiscal tightening in these nations (UNCC, 2011). For instance, the overseas development assistance flows increased in the immediate aftermath of the recent global financial and economic crises owing to long-term planning and commitments by donors, but they are expected to decrease or stagnate in the medium term due to ensuing their debt crises and fiscal consolidation in many donor countries (Ibrahim et al, 2011).

Hence, Foreign Direct Investment which is now considered to be one of the most stable components of capital flows and has become substantial share of capital formation in poor

countries can fill such resources gap between domestic saving and investment requirement in this region. Despite unevenly distributed across countries and major primary sectors (mineral and oil), Foreign Direct Investment (FDI) has been the main source of foreign capital inflows to Africa, overcoming Overseas Development Assistance (ODA) in terms of size since 2005, it contributed 20% of fixed capital formation in Africa over the last decade (UNECA et al, 2011).

However, one of the challenges that SSA facing today is how to attract more FDI to the region. As mentioned above a number of efforts have been made in the past to boost FDI flows; despite slight improvement they have not had much significant impact to attract more FDI flow to the region. These efforts have been unsuccessful because they were 'ill conceived did not lift underlying constraints on FDI to the region,' and failed to confront the challenges to the attraction of FDI to the region, and policy makers and African leaders are not determined and they have become reluctant to take more measures to attract more FDI to the region (Dupasquier et al, 2005). So, why all those efforts have been failed and what policy options would have been taken? Are all classical and institutional determinants of FDI which have functioned in other regions have been applicable in this region for the last decade? Which policy measures should have been given priority or more emphasis? How the institutional quality of the region apart from other determinants of FDI play role in this region? All these conditions can pose questions in one's mind.

Lliterature on determinants of FDI is still young (Blonigen, 2005) and most existing works are also statistically fragile (Chakarabarti, 2001). The existing research literatures in large extent tried to identify factors which determine FDI flows to the host country in which most of them have focused on the concept of traditional determining factors (Chea, 2011). The literature on economic development has been renewed by focusing on the quality of domestic institutions as a key explanation of cross-country differences in both growth rates and income per capita (Quere et al, 2005). This research project is motivated by the apparent lack of attention on the role of institutional factors on the FDI flow in this region. Because the prevailing social and political conditions of SSA for investment climate, the futility of the previous efforts to attract more foreign investment to the region and the African leaders' behaviour and skepticism toward

foreign investment forced to give more emphasis on institutional quality apart from other determinants of FDI flow.

There are several reasons why the quality of institutions may matter for attracting FDI. One is rooted in the results of the growth literature: By raising productivity prospects, good governance infrastructures may attract foreign investors. A second reason is that poor institutions can bring additional costs to FDI. This can be the case of corruption for instance (Wei, 2000). A third reason is that, due to high sunk costs, FDI is especially vulnerable to any form of uncertainty, including uncertainty stemming from poor government efficiency, policy reversals, graft or weak enforcement of property rights and of the legal system in general.(Mayer et al, 2005)

Empirical literature in particular in SSA and other region of the world have debated and there have had no clear conclusions on the role of institutional factors on FDI flow. Cattareo et al (2011) reviewing the impact of financial development apart from other determinants of FDI flow to SSA, they tried to see one aspect of institutional factor, corruption in their analysis and reached the conclusion that it has positive impact on FDI which is contrary to the previous studies and have suggested that corruption have remained very controversial. The analysis lacks the causal relationship between FDI and corruption, unavailability of adequate data, and robustness checks for other economic and trade variables.

Asiedu and Freeman (2009) explored the effect of corruption on investment growth in transition economy and in Latin America and sub-Saharan African, they used firm-level data on investment and measures corruption at the firm and country level, and allows the effect of corruption to vary by region. They found that the effect of corruption on investments varies significantly across regions; corruption has a negative and significant effect on investment growth for firms in Transition countries but has no significant impact for firms in Latin America and Sub-Saharan Africa. In fact (Mauro, 1995) demonstrated that corruption impedes investments and economic growth. Another important point was that their analysis pertains only to firms that were already operating within the country. It is likely that high levels of corruption may prevent many firms from operating in these regions in the first place. However, this loss of potential investment resulting from corruption is not captured by their model.

Hadjila et al (2010) explored empirically the linkages among political risk, business climate and foreign direct investment inflows to both 33 transition and developing countries and exploited the panel data on major institutional factors and other determinants of FDI, and in their investigation the reduced level of institutional factors political risk and favourable level of business operation conditions are associated with an increase in FDI flow in these countries. However, this study has not included any SSA countries except the three Northern African Arab states (Algeria, Egypt and Tunisia).

On the other hand, Dupisquier, et al (2005) tried to survey why foreign investors are reluctant to invest more in SSA, despite its enormous profitable opportunities. They found that relatively high degree of uncertainty in the region exposes firms to significant political risks. The region is politically unstable because of lack of extended freedom in politics and economics, the high incidence of wars, frequent military interventions in politics, and religious and ethnic conflicts. The study also showed that there is a statistically significant negative correlation between FDI and conflicts in Africa. On the other side Rogoff and Reinhart (2003) identified that the regional susceptibility to war index is 26.3% for Africa compared to 19.4% and 9.9% for Asia and the Western Hemisphere respectively. But the research was not supported by econometric analysis.

Contrary to the above empirical researches, Onyeiwu and Shrestha (2004) investigates the effect of the stylized variables on the flow of FDI using panel dataset of 29 African countries over the period 1775 to 1999 by employing the fixed and random effect models, Asidue (2006) explored the role of natural resource, market size, institution, government policy and political instability on FDI flow using a fixed-effects panel estimation for an unbalanced panel data for 22 countries over the period 1984–2000, and Ofori-Brobbey and Lucy O.(2009) examined the relationship between quality of governance and the flow of foreign direct investment (FDI) into Sub-Saharan African (SSA) countries for the period 1996 – 2004 using GLS random effects model. All have used econometric analysis for their findings however, some are a little past, they have not used the dynamic panel data analysis procedure to see the dynamic nature of the dependents and other explanatory variables, and also they have not made diagnostic tests.

Therefore, this study attempts to respond to such controversies and the questions raised above by examining the major institutional factors and the conventional determinants of FDI in sub Sub-Saharan African countries by using latest data, by employing static and dynamic econometric procedures based on the premises that institutional factors/policy variables can dominate over the conventional determinants in hampering FDI flow to this region.

1.3 Objectives of the Study

The main objective of this study is to identify the major factors that impede FDI flow in sub-Saharan African countries. The specific objectives are:

- To explore whether the existing institutional quality in SSA hindering FDI flow to the region.
- To explain whether the other traditional factors of FDI such as market size, natural resource and others are still playing substantial roles in FDI flow to the region.
- To identify indicators which obstruct the most foreign direct investors.
- To recommend policy direction based on the findings.

1.4 Significance of the Study

These days, good governance, efficient protection of civil and property rights, extended economic and political freedom and low level of corruption have been in particular shown to be associated with higher prosperity (Courpet et al, 2005). They have become a development agenda for every nation which want to be found in progress, and these issues have become also decisive factors apart from other criteria for Multinational Company (MNC) to come to a decision on whether to invest their capital abroad. Such measures are also principal prerequisite for western countries and international financial institutions such as IMF and WB to support financial assistance to projects and programs in poor countries. On the other side the literatures on economic development and FDI flows have been renewed by focusing on the quality of domestic institutions as a key explanation of cross-country differences in both growth rates and FDIs distribution. Concurrently, exploring such issues together with other factors as key

determinants to capital flow will contribute to understand more on the circumstances, and based on the findings it helps to take better policy instrument by policy makers to attract more FDI flow to the region. It also assists further researches specifically in this area for the future.

1.5 Scope and limitation of the Study

This research focuses on the relationship between foreign direct investment and institutional quality (mainly the rule of law control of corruption and regulatory quality) together with other conventional variables for unbalanced panel dataset of only 32 SSA countries covering the period 1994-2010. This is due to unavailability of complete dataset for all SSA countries for a long and the above specified time period. This could be the main limitation of this study.

1.6 Organization of the Study

The rest of the study is organized in the following way: in the next section a detail overview of the conceptual, theoretical and empirical literatures on foreign direct investment presented. Under chapter three, data and research methodology, the theoretical framework, empirical model, model specification, estimation techniques and diagnostic tests procedures are detailed. The descriptive and econometric results together with their interpretation are described in chapter four. Finally, the conclusion and policy implications are reported in chapter five.

Chapter II

Literature Review

Several literatures have identified the determinants of FDI as a key step to understand what the foreign investors want; they take them as prerequisites to invest their money in the host country. Hence, this chapter reassesses theoretical and empirical determinants of FDI flow to a host country. The first sub section defines and explains conceptual frame work of FDI, and then detailed theoretical and empirical reviews follow in the next two sub sections.

2.1 Definition and Conceptual frame work of FDI

International trade theories generally identify three types' factor movements: Foreign direct investment, portfolio investment, and labor migration. ***A foreign direct investment*** is defined as an investment in which the investor acquires a substantial controlling interest in a foreign firm or sets up a subsidiary in the foreign country. Direct foreign investment is thus involves ownership and /or control of business enterprise abroad. Companies that engage in direct foreign investment are known as multinational enterprise or transitional corporation (Markusen, 1995).

Foreign Direct Investment (FDI) is not only just a capital movement. In addition to capital, a controlled subsidiary often receives direct input of managerial skills, technology and other tangible and intangible assets. Unlike portfolio investors, direct foreign investors have substantial control over the management of foreign subsidiary. In fact, balance of payment accounts defines FDI as any flow of lending to, or purchase of ownership in, a foreign enterprise that is largely owned by the residents (usually firms) of the investing country (Thomas A. and Peter H. 200).

According to BPM5[1] definition, FDI refers to an investment made to acquire lasting interest in enterprise operating outside of the economy of the investor. The investor's purpose in this case is to gain effective control in the management of the enterprise. This definition is not adequate due

[1] BPMS : Balance of Payment Manual Fifth Edition (Washington, D.C., International Monetary Fund,1993)

to several reasons. Firstly, it suggests that FDI involves international transfer of money ignoring situation where FDI capital could be raised in the host country. Secondly the definition of FDI flows is expressed in terms of money capital when it incorporates the transfer of other income generating assets. Thirdly the definition does not take into account the new organizational forms that have appeared in the global economy over the last few decades as firms today can exercise various forms of control over distance enterprises firms that in turn enables to create productive assets in the host country. Usually, it is financed by capital coming from the investor's country. A transfer of ownership of local productive assets to a foreign investor is referred as international or cross border merger and acquisition.

According to the IMF and OECD definitions, an investment by a foreign investor is regarded as FDI if the direct investor holds at least 10 % of the ordinary share or voting power of a firm. Foreign *direct investment* reflects the aim of obtaining a lasting interest by a resident entity of one economy (direct investor) in an enterprise that is resident in another economy (the direct investment enterprise). The "lasting interest" implies the existence of a long-term relationship between the direct investor and the direct investment enterprise and a significant degree of influence on the management of the latter. Direct investment involves both the initial transaction establishing the relationship between the investor and the enterprise and all subsequent capital transactions between them and among affiliated enterprises, both incorporated and unincorporated. It should be noted that capital transactions which do not give rise to any settlement, e.g. an interchange of shares among affiliated companies, must also be recorded in the Balance of Payments (Duce and Espana, 2003, IMF 1993).

2.2 Types of Foreign Direct Investment

There are different types of foreign direct investment; these include *greenfield investment, cross border merger and acquisition, and reinvested earnings.* Greenfield investment refers to the establishment of a new firm that in turn enables to create productive assets in a host country.

Usually, it is financed by capital coming from the investor's country. A transfer of ownership of local productive assets to a foreign investor is referred as international or cross border merger

and acquisition. Reinvested earnings refer to part or all of the profit that is not repatriated to the investor's country but reinvested in the host country (UNCTAD, 1998).

Foreign direct investment can also be classified into market-seeking, export-oriented and government initiated FDI. Foreign direct investment is highly determined by the growth potential and the size of national market, access to regional and global markets and country-specific consumer preference. When a foreign firm produces raw materials, intermediate and final goods and sells these products for non-local market, this FDI is referred as export-oriented FDI. An investment is called government initiated FDI, when governments of host countries invite and give incentives to direct foreign investors to invest in specific sectors and industries with a view of addressing socio-economic problems like unemployment (Accolley et al, 1997). Likewise, there are also called a resource seeking and efficiency seeking FDI. Resource seeking is attracted by availability of low-cost unskilled and skilled labor, endowment of strategic natural resource and raw materials. Efficiency seeking FDI is significantly determined by productivity of labor resource, costs of inputs and intermediate goods (UNCTAD, 2007).

Similar to the above definitions, Markusen (1995) and Venables (1999) also distinguished the so called *horizontal and vertical FDI*. Horizontal FDI is a market-seeking investment the firm is supplying the domestic market, through an affiliate, with similar products than it offers on its home market. The objectives are to gain in trade costs and to improve strategic advantages in the rivalry with other local competitors. The foreign firm appears for example as an inside producer close to the consumers, or can be learning about their taste and behaviours. Vertical FDI is resource-seeking based on relative endowments and aims to minimize production costs, typically by utilizing a cheap labour force, and is attracted by factor cost differentials and repelled by trade costs.

2.3 Benefits and Costs of Foreign Direct Investment

Since the recent times, nearly all literatures and policies have favored the advantage of FDI in all aspects of economic development in host country. However, there is an opposing view to the role of FDI in developing economies. The buoyancy of FDI argued that FDI benefits the host

country, for instance by creating employment opportunities and bringing new technologies. On the contrary, the other group squabbles the adverse effects of FDI prevail over its benefits.

Those favor to FDI argue that economic growth depends on the rate of investment which in turn largely depends on savings. However, gross domestic savings are too low in the least developed countries (LDCs). Foreign direct investment is an alternative source of filling the gap between savings and the required investment. Foreign firms bring not only financial capital but also managerial techniques as well as, entrepreneurial and technological skills that lack in LDCs and these skills can be transferred to domestic firms through different channels. The government's budget deficits can also be filled by profit-tax may be collected from multinational companies. Besides, foreign currency that can be obtained from export and net public foreign aid falls short of the required amount by LDCs; hence FDI can help to fill this gap by reducing part or the entire deficit in the balance-of-payments. Moreover, the trans-national companies' manufacturing products that can be exported are able to generate net positive export earnings. FDI can also play important role by creating employment opportunities and by integrating the host-country's economy in to the world economy (Todaro, 1992, OECD, 2002).

Opposing to the above argument, FDI can have cost to LDCs. Although initial investment of foreign firms improves the current and the capital account of the host country, in the long run, substantial import of intermediate and capital goods, repatriation of profit, interest, royalties and management fees may harmfully affect the foreign exchange position of the host country. Foreign firms may also fail to reinvest the profit they generate in the host country; hamper the growth of domestic enterprises and domestic investment by importing the input and intermediate product from their subsidiaries in other countries. FDI might also inhibit the development of indigenous skills as the result of multinational companies' dominance over local enterprises. Furthermore, governments often enter in to exclusive agreements with foreign firms and provide tax holidays, tariff protections, and investment allowances. (OECD, 2002, Thomas A. and Peter H. 2000, Todaro, 1992).

2.4 Theoretical Literature

2.4.1 The Neoclassical Approaches of FDI

Early explanations of multinational production were based on neoclassical theories of capital movement and trade with the Heckscher-Ohlin framework. According to the early neoclassical approach, interest rate differentials are the main reason for the firms to become a multinational company. In this line of arguments, capital moves from a country where return on capital is low to a place where return on capital is high. However, these theories were founded on the assumption of perfect competition principle; existence of perfect factor movement and good markets, and capital moves free of risk assumptions. In other word, in the absence of market perfections, these theories presumed that FDI would not take place. "The portfolio approach to FDI reacted to this early theory of FDI by emphasizing not only return differentials but also risk" (Berhanu, 1999). The movement of capital is not only unidirectional, capital can move from countries where return on capital is high to countries where return on capital is low and vice versa (Harrison et al 2000). Even though there are risks in investing abroad, there must be distinct advantages in host country that MNCs are attracted to. Therefore, these theories were unable to provide satisfactory explanation for the nature and pattern of FDI flow.

2.4.2 The Product Life Cycle Theory of FDI

This theory was first developed by Vernon in 1966 to describe how a firm tends to become multinational at a certain stage in its growth. He argued that a new product is first produced continuously and sold in home market until the home market is saturated. At the early stage, the product is not standardized. That is per unit costs and final specifications of the product are not uniform. As the demand for the product increases the product will be standardized. Because countries are at different stages of economic development, new markets are available to receive new products through the demonstration effect of richer countries. Hence, the products will be exported to these countries. The firm starts to open subsidiaries in locations where cost of production is lower, when the competition from the rival firms intense and the product reaches its maturity. Other countries may offer comparative cost advantages so that gradually production shifts to these countries.

Vernon's product life cycle theory is better and useful on several account, it is a dynamic theory because it deals with changes overtime. It explains the concentration of innovations in developing countries, offers integrated theory of international trade and FDI. Furthermore, it provides an explanation for the rapid growth in export of manufactured goods by newly industrialized countries. It, therefore, presents a useful point of departure for the study of the causes of international investment. However, the theory is not confirmed by empirical evidence, as some multinational companies start their operations at home and abroad simultaneously. The hypothesis does not also resolve the question of why multinational companies opt for the use of local firms in the host countries (Dunning 1988, Chen, 1983, Hymer, 1976). Hence, further theoretical outlook of FDI was necessary.

2.4.3 The Eclectic (OLI) Paradigm of FDI

The classical theory of FDI gives a first explanation how multinational enterprises decide to invest abroad. Any analysis of direct foreign investment must identify the advantageous conditions that can outweigh the inherent disadvantages of foreign production. One organizing framework was proposed by (Dunning, 1980, 1988), who suggested that three conditions are necessary for a firm to undertake direct investment. This has become known as the **OLI** framework.

First a firm must have an ownership (**O**) advantage; this could be a product or a production process to which other firms do not have access, such as patent, blueprint, or trade secret. But the advantage could also be as intangible as a trademark or a reputation for quality. The ownership advantage is anything that gives the firm enough valuable market power to outweigh the disadvantages of doing abroad.

Second, unlike ownership advantages, location advantages (**L**) are country specific advantages, the foreign market must offer a location advantage to MNCs which makes it more profitable to produce in the foreign country than to produce at home and export to foreign market. This includes accessibility and low cost of natural resource, adequate infrastructure, political and macroeconomic stability, low tariff, quotas, transport costs, and cheap factor prices are the most

obvious source of location advantages. But more intangible factors, such as customer access, can also be important. Thus, this sub-paradigm asserts that the more the immobile, natural or created endowments favor a presence in a foreign location, the more firms will choose to augment or exploit their own-specific advantages through international production .

Third, the multinational enterprise (MNCs) must have an internalization (**I**) advantage. This is the most abstract of the three conditions, it is explaining the activity of firms outside their national boundaries, which related to the way the firms organised the generation and use of the resources and capabilities within their jurisdiction and those they could access in different locations. In other words, it explains fully the extent and pattern of the foreign value added activities of firms. A firm can have the advantage of a proprietary product or production process, and tariffs and transport costs advantage to produce abroad rather than to export, but it is still not certain that a company should set up a foreign subsidiary. One fairly simple alternative would be to license a foreign firm to produce the product or use the production process. One can ask why not just sell the blueprints to a foreign firm other than go through the costly and difficult process of setting up a foreign production facility. Because the process is better exploited internally within the firm jurisdiction rather than at arm's length through markets.

Despite it has been criticized for only listing those conditions necessary for FDI without explaining its phenomenon; the Dunning's OLI paradigm has remained the dominant analytical framework for accommodating a variety of operationally testable economic proposals of the determinants of foreign direct investment.

2.5 Institutional Theory of FDI

Most of the previous literatures have, to a large extent based on the traditional theoretical frameworks for their empirical study to characterize the main factors that determine the flows of FDI, yet they do not explain the whole picture of uneven international distribution of FDI among countries. The institutional quality of the host countries viewed as a crucial location advantage, which has also got much attention recently as one of the major determinants of FDI in the context of developing countries (Azam et. al., 2010, Aritfia and Abdullah, 2010, Tintin, 2010, Hadjila k. 2010, Barrell and Pain, 1999, Asiedu and Freeman, 2009, Mayer, 2007 and Bevan

et.al., 2004). Good institutions, which secure property rights, guarantee the political stability and weaken the corruption, promote a good investment climate. The interest in the links between institutions and FDI in the literatures is based on the insight of new *institutional economics,* which has been as a dominant school of thought since 1960, with its emphasis on unbounded rationality, property right, lack of information and other factors that affect transaction costs (North,1990).

New Institutional Economics (NIE) disagree with the Neoclassical assumption of 'allocationally' neutral effect for all type of institutions (legal, political, monetary and others) during transaction or any economic activities; and the unbounded perfect individual rationality (zero transaction cost assumptions). NIE argues that economic development is not simply the result of amassing economic resources in the form of physical and human capital, but it is also a matter of "institution building" that reduces information imperfections, maximises economic incentives and reduces transaction costs.

According to North (1990) an institutional environment of host country includes rule and regulation, norms and customs, process and procedure that matters for MNCs. It is argued that government play an important role for MNCs by providing stable political and economic environments, contract enforcement, skilled workforce and sound infrastructure both at macro and micro levels.

Macroeconomic policy including monetary, fiscal and trade liberalization policy effects are also translated to FDI through cost of credit channel, tax channel and credibility of trade openness policy channel, the domestic currency position against international currency, interest rate and inflationary condition of the host country can have their outcomes on FDI (Azam et al, 2011). Hence, there are strong possibilities that institutional quality and macroeconomic environment have significant impact on FDI flow.

2.6 Empirical Literature

2.6.1 Institutional quality and FDI

This section is devoted to highlight different results and debates which have been made by scholars about the effect of institutional quality on FDI. Indeed, the impact of institutional quality on FDI has been examined in limited extent in Sub-Saharan Africa Countries, it is attempted to survey those examined in the region and in others' to demonstrate how institutional quality can be determinant factor for attracting FDI flows to host country.

Rodrik (2004) compared the prevailing condition of the institutional quality on economic growth in the poor and rich countries. He argued that rich countries are those where investors feel secure about their property rights, the rule of law prevails, private incentives are aligned with social objectives, monetary and fiscal policies are grounded in solid macroeconomic institutions, idiosyncratic risks are appropriately mediated through social insurance, and citizens have recourse to civil liberties and political representation. In Poor countries, however, are those where these arrangements are absent or ill-formed. Institutions are causal in the sense that a poor country that is able to revise the rules of the game in the direction of strengthening the property rights of investors is likely to experience a lasting increase in its productive capacity.

Rodrik's argument can also be examined by related empirical literatures which referred to the link between FDI and institutional quality in developing / less and middle income countries. For instance, Busse and Hefeker (2005) explored the linkages between institutions and foreign direct investment inflows using a sample of 83 developing countries over the period 1984 to 2003, they identified those indicators that matter most for the activities of multinational corporations and found that many sub-components of institutional quality (government stability, internal and external conflict, corruption and ethnic tensions, law and order, democratic accountability of government and quality of bureaucracy) are highly significant determinants of foreign investment inflows. In other studies, Kirkpatrick et al (2006) made empirical examination of the relationship between the quality of the regulatory framework and foreign direct investment (FDI) in middle and lower income developing countries during the period 1990 to 2002. Their result confirmed that FDI responded positively to an effective domestic regulatory framework. By

implication, where regulatory institutions are weak and vulnerable to be "captured" by the government (or the private sector), foreign investors may be more reluctant to make a major commitment to large scale infrastructure projects in developing countries. Hyun (2006) also analyzed the short run and long run relationship between institution quality and FDI inflows by analyzing the data of 62 developing countries over the period of 1984 to 2003 and found that there is no clear evidence for short run causality between these two variables but institutional quality affects positively FDI in long run.

Coming to Africa/ SSA, Zenegnaw (2010) identified the significance of political factors together with other factors for FDI flow. His results suggested that a sustainable political condition in host country facilitate foreign investors regarding business expansion, property right protection, etc. that play crucial role for FDI attractiveness to African countries. Addison and Heshmati (2003) identified that governance in African countries was overwhelmed by a relatively higher degree of political uncertainty compared to the rest of the world. In addition, policy making was often blurred or confusing. Few countries pursue sensible macroeconomic management policies and FDI as a credible source of alternative funds is relatively new. Asiedu (2004) also argued that although SSA has reformed its institutions, improved its infrastructure and liberalized its FDI regulatory framework, the degree of reform has been mediocre compared with the reform implemented in other developing countries. As a consequence, relative to other regions, SSA has become less attractive for FDI. An important implication of these results was that in a competitive global economy, it was not adequate just to improve one's policy environment: improvement need to be made both in absolute and relative terms. Ofori-Brobbey and Ojode (2009) examined as well the relationship between quality of governance and the flow of foreign direct investment (FDI) into Sub-Saharan African countries for the period 1996 - 2004. The result showed that along with other factors the quality of governance appeared to be increasing in importance in attracting foreign investment to the region. That was evident particularly in the less resource-endowed countries.

As whole, there is almost consensus on the institutional determinants of FDI flows to the host countries; however, Onyeiwe and Shresha (2004) contrary to these perceptions, they argued that political rights were unimportant for FDI flows to Africa. There are also debates on another

component of institutional quality, corruption, on FDI flow to host countries. It has been examined differently by different literatures. Corruption is believed to be impediment of economic progress and social development; it undermines investors' confidence in an economic system. But it has got some degree empirical controversy among researchers. For instance, Wei (2000) observed the data for 143 countries over the period of 1995 to 1997, his study identified together with other institutional factor, corruption is found to have negative relation with FDI inflows, opposing to this pronouncement, Egger and Winner (2005) investigated the impact corruption on FDI inflow, using 73 developed and less developed countries for the time period 1995–1999. They found that corruption has a positive relationship with FDI inflow and can indeed be a stimulus for some kinds of FDI. They concluded that corruption, acting as a helping hand; it can sometimes be an incentive for inward flow of FDI.

2.6.2 Economic determinants of FDI

This sub section tries to scan how different studies have surveyed the relation between the classical and macroeconomic determinants, and FDI inflow.

2.6.2.1 Classical determinants of FDI

Empirically many literatures identified the classical and macro policy reforms reviled as the key determinants of FDI inflow in the host countries. According to Dunning (1998) the market size, high growth rate and resource endowment are the key derivers for Multinational Corporation to invest their capital in developing countries. This Dunning's theory of eclectic on FDI has induced empirical literature to large extent to identify the main factors which these countries have to provide so as to succeed in attracting more FDI inflow.

However, the variables which were identified as determinants of FDI vary from research to research and country to country. For instance one of the most determinants of FDI in Africa today is the natural resources; as literatures proved most of the FDIs in SSA have been driven by this resource endowment especially since long time. Even the need to secure economic and reliable sources of mineral and primary products for the (then) industrializing nations of Europe, North America and Asia (China) natural resources were the major reason for the expansion of

FDI (Dunning, 1993). In this regard several literatures assured the historical importance of this and other variables that effect FDI flow to the host country.

Supportive to this state of facts, Asiedu (2003) reviewed the impact of several variables including natural resource endowment, market size, infrastructure and macroeconomic factors on FDI flow to Africa. She used panel data of 22 African countries for the period 1984–2000 to examine empirically. She found that FDI in Africa is solely driven by natural resource availability and she concluded that natural resource endowment, large markets, good infrastructure and an efficient legal framework promote FDI. Jenkins and Thomas (2002) examined also the determinants and characteristics of FDI in Southern Africa. They argued that in addition to the size of the local market, particularly for non-primary sector enterprise, natural resources and privatization is an important motivation for FDI in the region. Onyeiwe and Shresha (2004) explored the magnitude, dynamics and determinants of FDI in Africa. Based on a panel data set of 29 African countries over the period 1975 to 1999, the paper identified that alongside other factors economic growth and natural resource availability were found to be significant for FDI flow to the continent. But contrary to conventional wisdom, the study showed that infrastructures were found to be unimportant for FDI flows to Africa.

Zenegnaw (2010) identified the demand side factors importance for FDI inflows over the period of 1980 to 2007 for 45 African countries. The study using a fixed effect least square dummy variable (LSDV) model for estimation and revealed that trade openness, market size and infrastructure in host country exerted positive effect on FDI inflows. Anyanwu (2011) examined what determine FDI flow to Africa by taking panel of seven five-year non-overlapping windows for the period 1980-2007. The paper identified that market size, openness to trade have positive impact on FDI flows and especially natural resource endowment and exploitation have significant effect to attracts huge FDI to the continent

Of course, there are no as such much significant differences in the importance of economic factors on FDI flow to SSA comparing to other regions, but by re-evaluating different literatures on these determinants, we can sight which stylized factors drive more MNCs to SSA than other developing countries. Mottaleb (2007) identified the determinant of FDI , using panel data of 60

low-income and lower-middle income countries over the period 1997-2005, he found that countries with larger GDP and high economic growth rate and with abundant modern infrastructural facilities, such as internet can successfully attract FDI , Din (1994) used per capita GDP as a proxy for market size by empirically estimating the data of 36 lower developing countries for the year of 1983 and found that large market size increase FDI inflows.

Sahoo (2006) analyzed the data for five South Asian countries and used panel co- integration technique to examine long run relationship between economic variables and FDI inflows. The study identified that market size; trade openness, infrastructure index and labor force growth rate were major determinants. Similar works proved that market size, infrastructure, and openness affect FDI flow to the host country. (Assunçao and Teixeira, 2011, Parletun, 2008, Ben-Taher and Gianluigi, 2007, Linda and Said, 2007, Bevan and Estrin, 2004 and Khadaroo et.al, 2003).

2.6.2.2 Macroeconomic Environment and FDI

Multinational corporations evaluate not only criteria for natural endowment, infrastructures and market growth, but also they take into consideration the macroeconomic stability condition of the host country. When selecting the target country to perform FDI, they see both their profit opportunities and the capacity of this country to conduct a long-term macroeconomic policy to maintain such scenario. The higher a country's conditions for economic stability and growth are, the higher its propensity to receive FDI. For this reason, in addition to the role of classical determinants identified above, a number of recent studies have attempted to identify the role of structural reforms, business environments, trade and financial liberalization regulations in financial system as key determinants in attracting FDI inflows in developing countries. Thus, the key determinants of FDI in the literature include inflation, exchange rate effects, low external debt, taxes, tariffs, trade openness and financial liberalization, the size of the manufacturing sector (i.e. agglomeration economies) and time dummies to allow the shifts of the intercepts over time (Ibrahim et al, 2011, Anyanwu ,2011, Fiess and Macdonald, 2010, , Ali, 2006 and Asiedu, 2004).

For instance, existence of sound financial system and regulatory quality are very essential and bring confidence to MNCs so that they can invest their capital in the host countries. Countries

with better financial systems and financial market regulations can exploit FDI more efficiently and achieve a higher growth rate. In this view, Durham (2004) and Alfaro et al. (2004) argued that countries need not only establish a sound banking system, but also a functioning financial market to allow entrepreneurs to obtain credit to start a new business or expand an existing one. In this way, countries are able to benefit from inward investment to achieve a higher growth rate. In other study, Busse and Groizard, (2008) concluded that any attempts by government to attract capital in the form of foreign direct investment by offering special tax breaks are not likely to yield the expected beneficial effects if the regulatory quality is low. In addition to boosting the regulatory quality and liquidity of financial markets, host countries have to reform their fundamental framework for regulations to enhance chances that FDI inflows can contribute to higher growth rates.

There are arguable views with regard to financial development and regulation on FDI flow to SSA, and LDs. Ezeoha and Cattaneo (2011) who examined impact of finance together with other factors on FDI using a panel data set spanning from 1995 to 2008 and drawn from 30 Sub-Sahara African countries, the study identified in addition to others factors financial development and urban agglomeration are among the important factors that influence FDI flows to the region. Comparatively, the study also shows that financial development, infrastructure and trade openness play more role in attracting FDI to non-resource endowed countries than they do in resource endowed countries. In similar analysis, stable, transparent and reliable legal and regulatory frameworks promote both domestic and foreign investment; where an inefficient and ineffective legal system is an impediment to enforce laws and contacts (Birhanu and Kibre, 2003). In other study, Anyanwu (2011) examined that agglomeration has a strong positive impact on FDI inflows but financial development has negative effect on FDI flow to Africa. UNCTAD (1999) also indicated that an efficient and transparent legal system, and in particular LDCs, did not automatically make a country more attractive for FDI.

Other macroeconomic policy variables with FDI have been also examined. De Mello (1997) investigated how inflation can impact negatively on the flow of FDI, he argued that inflation sometimes signals weakness in a country's economic conditions and monetary management and, because it affects the profitability of businesses. Ahnsy et al (1998) explored the relationship

between exchange rate, inflation and FDI over the period 1970 to 1981 for developing countries and they found that high inflation rate can affect FDI inflows. They identified also inflation resulted overvaluation of exchange rate adversely affects FDI inflows. In related studies, inflation and higher levels of other distortions such as capital controls that help parallel and illegal currency markets thrive and bring disastrous effect on FDI inflow and they elucidate that both domestic and foreign investors will be unwilling to invest in an atmosphere of a high inflation rate (Rogoff and Reinhart, 2003, Asiedu and Freeman, 2009; Mumtaz, 2011; Yartey and Adjasi ,2007, Anyanwu , 2011).

On the other hand, exchange rate effect on FDI is inconclusive. Differing idea forwarded depending on foreign firms' market seeking and efficiency seeking investment with exchange rate. Those who are driven by host country market need domestic currency's appreciation because they assume that an increase purchasing power of the people and then maximizing their gain, while efficiency seeking investors can be attracted by depreciation of host country's currency which provides cost reduction opportunities in purchasing the country's assets, which leads to an increase in FDI flows (Chen et al, 2006, Xing and Wan, 2006)

In general, as it was explained earlier in the introduction part and later reviewed in the theoretical and empirical literatures, the flow FDI and its uneven distribution have been examined from different perspectives that varies from research to research and country to country, and ttherefore, it is difficult to drive one list of determinants of FDI, especially as some have gained or lost importance over time (UNCTAD, 1998). It is also difficult in reality in many countries to isolate the different motives, as one motive may overlap into another (Basu and Sinivasan, 2002).

From what we reviewed above and a consensus exists among many literature previously studied; there are core and most selected factors that affect FDI flow to developing countries (UNACTD, 1995, 1998, Asiedu ,2002, 2004, Chakrabarti 2001, Onyeiwu and Shersthe, 2004): ***Institutional quality*** like (Political freedom and stability, rule of law, regulatory quality, corruption, democratic or voice accountability, institutional strength, government effectiveness and quality of the bureaucracy and others), ***the classical determinant*** (market size, natural resource

endowment, GDP growth, infrastructure) and ***the macroeconomic policy/ environment*** (inflation, exchange rate, agglomeration, openness of the economy, taxes, financial system, and labor cost) are essential for FDI flow to host country. Based on these major variables of interest, later, an empirical model will be estimated using selected major factors to examine the extent to which whether these variables influence FDI flows to Sub Saharan Africa countries. In the next stage we proceed to estimation procedures after we present the data source and methodology of the research project.

Chapter III

Data and Research Methodology

3.1 Data and Data sources

The panel datasets contain observations on 32 Sub-Saharan Africa countries covering the time period from 1994 to 2010. Countries were selected depending on availability of complete data set on all variables required for the study. All data in this study are secondary in nature. The list of countries used in this research is described in appendix-A.

There are different sources for the variables of interest cited in this research. Almost all FDI dataset along with the key explanatory variables of concern have been collected from World Bank World Development Indicators (WDI) and Global Development Finance (GDF, 2012). UNCTADstat database is also used as to complete some missing data in some sampled countries.

With regard to institutional quality data, there are different sources. But some of them vary in measuring techniques, some are measured in combined form and others are provided in disaggregated manner. For this study data on institutional indicators are collected from World Governance Indicators of the World Bank. There are six World Wide Governance Indicators (WGIs): i) Control of Corruption, ii) Governance Effectiveness, iii) Political satiability and Absence of Violence/Terrorism, iv) Regulatory Quality, v) Rule of Law, and vi) Voice Accountability. Estimate of each indicator, according to the source, ranges from -2.5 (weak) to 2.5 (strong) governance performance.

3.2 Model specification and Estimation Techniques

In this section the theoretical framework and the empirical models of FDI are discussed and specified. Based on this discussion and specification of the model, econometric estimation techniques and diagnostic testing procedures follow.

3.2.1 Theoretical Framework

The theoretical model of FDI is consistent with the existing theories of international production, where the demand for inward-bound FDI is said to depend on a variety of characteristics of the recipient country as well as the emergence and reason for movement of multinational firms across overseas to invest their capital. Multinational firms take into consider action several advantages before taking actions for their investment decisions, for instance, companies from abroad are identical to domestic ones, it would not be profitable for them to enter host markets, given the likelihood of additional transactions costs of operating in a foreign environment (Caves,1996, Bevan and Estrin, 2004).

As mentioned in the theoretical literature section, John Dunning (1980, 1988) proposed a comprehensive approach based on ownership, location, and internalization advantages to explain the concept of FDI. He argued that three conditions must be satisfied simultaneously for FDI to occur. The firm must have both an ownership advantage and an internalization advantage, while the foreign market must offer a locational advantage. Ownership advantages take the form of firm-specific assets both tangible, e.g., products or technologies; and intangible, e.g., patents or brands. Hence, the firm is able to more than offset the incremental transaction costs of multinational operation because of the cost or demand benefits conferred by the ownership advantage. Multinational firms also need an internalization advantage in the sense that benefits accrue to the enterprise from exploiting the ownership advantage from choosing to produce abroad internally, rather than through the market by franchising or licensing the product or process internationally.

Recently, Dunning and Lundan (2008) also explained the motives for FDI, and put them into four categories: natural resource seeking, market seeking, efficiency seeking, and strategic asset or capability seeking. They also note that firms may engage in FDI activity in more than one of the four motives. Hence, using this Dunning's basic arguments on the motives of FDI flow, and following the work of Masron and Abdullah (2010) and other similar studies, the basic theoretical model is simple equation written as:

$$FDI = f(NRSV, MSV, ESV, SASV) \quad \ldots\ldots (1)$$

Where NRSV stands for natural resource seeking variables, MSV stands for market-seeking variables; ESV indicates efficiency-seeking variables and SASV strategic asset seeking variables. Here, based on FDI definitions in the previous section, proxy measures of natural resource seeking variables are determined by availability of low-cost unskilled and skilled labor, endowment of strategic natural resource and raw materials. Market seeking variables are determined by the growth potential and the size of national market, access to regional and global markets. Efficiency seeking variables are determined by productivity of labor resource, cheap factors of production, and the like, and strategic asset seeking variables could represent oil and minerals.

The above equation and explanation clearly indicate that the Dunning's location advantages are more relevant in attempting to explain as initial theory of FDI flow in the host country than others. According to the eclectic theory of FDI, countries that have a 'locational advantage' will attract more FDI (Dunning, 1988). Location-specific advantage also covers any characteristics (economic, institutional and political) that make a country attractive for FDI. This includes large domestic markets, the availability of natural resources, an educated labor force, good infrastructure, low labor costs and reliable institutions (as cited by Asiedu, 2002). Hence, most theoretical or empirical model on the determinants of FDI founded on the basis of Dunning (1980, 1988) eclectic theory of FDI especially location specific factors; and the model provides a useful organizing theoretical framework.

However, with the variability of the determinants of FDI due to prevailing conditions of the host countries, with the rapid increase in FDI since the mid–1980s and the growth of regional integration Di Mauro, (2000), the proximity and concentration advantages by Matthieu et.al (2002), the above theory alone has not succeeded in explaining the rapid phenomenal changes that influence FDI flow. This has brought a squabble by many researchers that since there is no one common theoretical model that attempting to explain FDI flow; therefore, empirical studies on FDI should adopt pragmatic approach in selecting the explanatory variables to be included in the regression (kamaly, 2004). For instance, a recent survey on FDI determinants by Faeth (2009) presents nine theoretical models explaining FDI flows along with their empirical

performance. The author showed that there is no single theory of FDI, rather a variety of theoretical models attempting to explain FDI. Thus, the existing 'theory' of FDI integrates OLI with a combination of factors from a variety of theoretical models including government policies that influence FDI flows.

Hence, the location advantage by Dunning's (1980, 1988) , kamaly (2004) and Faeth (2009) pragmatic and theoretical approaches of determinant variables of FDI among others include: market size, market growth, resource endowment, institutional quality, relevant government policies like economic stability, measure on openness to international market and others. From this premise, the above theoretical model has been modified as the following form:

$$FDI = f(MS, NR, GDP, INS, GOPL) \quad (2)$$

Where, *FDI* is foreign direct investment, *INS* is institutional quality, *GDP* is gross domestic product , MS is Market size, NR is Natural resource endowment and GOPL is government policies with regard to FDI.

3.2.2 Empirical Model

As mentioned above since there is no standard procedure that would be used as a common theoretical model for the determinants of FDI flows, some researchers focus on macroeconomic determinants, some on institutional analysis, some on specific factor like infrastructure, natural resource endowment, some determinants of business environment and risks including political stability and some on the combination of different factors. Most researchers who undertake empirical work on the determinants of FDI flows use an ad-hoc specification, that is, they try various indicators that may explain differences in FDI flows across countries and use those that are most suitable for the purpose of their research (see Gastangal et al., 1998, Chakrabarti, 2001, Asiedu, 2002, Khadaroo and Seetanah, no yr, Baltagi et al., 2009).

Hence, the empirical model for this research has been chosen based on the theoretical frame work discussed on the above sections; and by taking into account the variables that importantly explain the model in the context of the SSA countries under study, and multinational company's

way of rationalization. I follow also some of recent empirical works, particularly, Faeth (2009) and Hadjila (2010) who used more or less most of the variables: institution, market size, infrastructure, market growth, educated and the macroeconomic variables in their empirical model. Thus, in line with these empirical studies the following empirical model is specified for this study.

$$FDI_{it} = f(IS_{it}, MS_{it}, NRS_{it}, INFR_{it}, FD_{it}, OP_{it}, , INFL_{it}, EXR_{it}\ AG_{it}) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Here, i is used to index the countries and t is to index time and the rationale for including these variables, their proxy measure and expected sign are described as follows.

The Dependent Variables (FDI)

The theoretical model is based on FDI flows to the host country's economy; it is measured as the net foreign direct investment inflow as a percentage of GDP (FDI/GDP). It is widely used measure of FDI flows to the host country in terms of its economic size (see Asiedu, 2006, Mohamed and Sidiropoulos, 2010, Susana et al. 2011).

INDEPENDENT VARIABLES

Institutions (INS): as mentioned briefly in the preceding sections, quality of institutions which are described in this study as Political freedom and stability, rule of law, corruption, internal conflict, voice and democratic accountability, institutional strength or government effectiveness, regulatory or bureaucratic quality can have significant effect on the flow of foreign investment in host country. For this study, the basic elements of institutional quality adopted here only serve as useful surrogates in SSA. Thus, we like to include components of the governance indicators as described by World Governance Indicators (WGIs) in our institutional variables. These are: voice and accountability (VA), political stability and absence of violence (PS), government effectiveness (GE), regulatory quality (RQ), rule of law (RL), and control of corruption (CC). The fact that the institutional indicators are highly correlated with each other as depicted by many researchers, Globerman and Shapiro (2003), Daniele et al. (2006), Lucy and Kwadwo (2009).

As whole, WB Governance indicators which have been developed by Kaufmann, Kraay e Mastruzzi (2005), have the following reflections and measurements, and each index can take values from -2.5 (low) to 2.5 (high) score as mentioned above.

Political Stability (**PS**): a measure of political instability, potential for terrorism and violence; this index measures the perceived likelihood of a government being toppled by unconstitutional or violent means, to put directly government are changed by coups, by assassination including any political murder or attempted murder of a high government officials, revolution include any illegal change in the ruling government (Asiedu, 2000, Susana et al. 2011), all these expressing the host country's political risk and the hypothesis is that political instability deters FDI. It is expected that high indexes of political stability, which reflect low political risk, tend to attract more FDI.

Rules law (RW): highlights the extent to which agents have confidence in and abide by the rules of society, including the quality of property rights, the police, and the courts, as well as the risk of crime, enforceability of contracts, as well as the impartiality of the legal system and the degree of compliance with the law. A high rating implies the grater impartial court system. It is thus expected that a high degree of effectiveness of the rule of law should attract foreign investors, since it gives them greater security and confidence.

Control of Corruption (CC): as pointed out earlier, there are contradictory remarks about corruption, but several investor surveys suggest that one of the most important deterrents of FDI to Africa is corruption. Several papers have also shown that inefficient institutions as measured by corruption and weak enforcement of contracts deter foreign investment (Wei, 2000). The corruption variable measures the degree of corruption within the political system. It covers actual or potential corruption in the form of nepotism, excessive patronage and bribery (Asiedu, 2000, 2006; Cleeve, 2008).The higher the value the greater the transparency (lower the corruption level). Lower score indicates corruption is more prevalent and linked to lower FDI flow.

Regulatory quality (*RQ*): demonstrates the ability of the government to provide sound policies and regulations that enable and promote private sector development. Among others it include: the ease of regulations concerning licensing requirements and labour, environmental, consumer safety and worker health and other related policies and regulations. The high score implies the government has good regulatory quality that may entail lower costs for foreign investors.

Voice accountability (VA): measures civil liberties, the freedom of expression, and freedom of press, freedom of association and organization rights as well as the extent to which a country's citizens are able to participate in selecting their government. High value of the index implies there is democratic accountability, existence of free society and non repressive government, which is linked to positive flow of FDI.

Government effectiveness (*GE*): reflects the quality of public services, the capacity of the civil service and its independence from political pressure and affiliation. That is the national bureaucracy enjoys autonomy from political pressure in a stable manner and whether it has an effective mechanism for recruiting and training, and as well as having the quality of policy formulation. A high score implies the civil service has the strength and experience to govern without drastic changes in policy and interruptions in government services, which strong positive link with FDI.

In this study, from the prevailing condition of SSA the most influential ones like rule of law (RL), control of corruption (CC) and regulatory quality (RQ) and their composite average form would be considered separately in our econometric model.

OTHER INDEPENDENT VARIABLES

Market size (MS): a market seeking FDI is highly determined by the domestic market size of the recipient countries. For foreign investors the size of the host market, which also represents the host country's economic conditions and the potential demand for their output as well, is an important element in their FDI decision-makings. Since this variable is used as an indicator of

the market potential for the products of foreign investors as confirmed by many studies(Morisset, 2000, Wei, 2000, Campos and Yuko Kinoshita ,2006, Khadarooa and Seetanahb, 2004, Mhlanga *et al.*, 2010).) **Per capita GDP** is used as proxy measure for market size. The importance of the market size for FDI flow as has been described in previous empirical studies, a positive sign is expected.

Natural Resource (NRS): as hypothesized by the location specific advantage of the eclectic theory of FDI, countries that are endowed with natural resources would receive more FDI. The omission of a measure of natural resources from the estimation, especially for African counties case, may cause the estimates to be biased (Asiedu, 2002). One of the proxy's measures of natural resource endowments as used by many authors is the weight of fuel and mineral exports in total exports. Alternatively, like Abel E. Ezeoha and Nikki Cattaneo (2011) and Campos and Kinoshita (2006), resource dummy is used as a substitute to measure for this variable of interest. According to IMF classification of resource endowed and non-endowed countries, we can use dummy variable representing a resource-rich (given binary digit 1) otherwise (binary digit 0). In this study, the share of fuel, metals and ores in total exports is taken to capture the availability of natural resource endowments, and positive sign is expected with FDI.

Infrastructure (INFR): efficient, reliable and adequate infrastructure services decrease transaction costs. They also increase the productivity of investments and accelerate the pace of market development. As a result, they are prerequisite to market-seeking and efficiency-seeking FDI. Good infrastructure facilitates production, reduces operating costs and thereby promotes FDI (Wheeler and Mondey, 1992; Asiedu, 2002). In the recent literatures the number of telephone main lines per 1000 population is often used as a proxy for infrastructure development, and positive sign is expected from the result.

Inflation (INFL): a price instability or high rate of inflation is a good signal for macroeconomic condition of a host country that foreign investors are very cautious to make decisions for their investment. The persistence of such situation implies the inability or unwillingness of the government and the central bank to balance the budget and to restrict money supply. Existence of stable macro condition like a history of low inflation and prudent fiscal balance signals to investors how committed and credible the government is (Campos and Kinoshita, 2006).

Therefore, as confirmed by many researches, higher rate of inflation, linked to the less foreign direct investment flow; and as a rule annual average change of consumer price or GDP deflator used as proxy measure for inflation rate, and negative sign is expected from the results.

Exchange rate (EXR): as explained priory in the empirical literatures, the influence of the exchange rate on FDI is ambiguous, and depends on the motivation of foreign investors. A depreciation of the host country currency makes on the one hand, local assets and production cost comparatively cheaper and, on the other hand, imports more expensive, leading therefore to higher inflows of FDI. A depreciation of local currency could also be as a signal for further depreciation, and then incentives to invest in the future would be diminished, leading foreign firms to either delay, postpone or cancel investment. Thus, the host country's currency exchange rate against foreign one could have negative or positive impact on FDI (Benassy et al. ,2000, Ben-Taher and Girogrioni, 2007 , Chen et al, 2006, Xing and Wan, 2006). ***Real effective exchange rate index*** *is* used as a proxy measure for this variable of interest.

Openness (OP): openness of the economy is seen in the literature as one of the key determinants of FDI. It is a standard hypothesis that openness promotes FDI. A country can increase its attractiveness by adopting a policy that favours foreign trade, encouraging domestic producers to export, increasing their profitability and attracting foreign investors (Mohamed and Sidiropoulos, 2010, Susan et al. 2011). In the literature, the ratio of percentage of ***trade to GDP*** is often used as a measure of openness of a country. This proxy measure is also important for foreign direct investors who are motivated by the export market. Empirical evidences (Aseidu, 2002; Cleeve, 2008) among others confirmed that higher levels of trade especially exports lead to higher FDI inflows. A positive relation of this determinant with FDI is expected.

Financial Development (FD): in line with Abel E. and Nikki (2011) and Hartmann et al. (2007), financial development is described as the process of financial innovation, as well as institutional and organizational improvements in a financial system .This implies that the more developed a country's financial system is, the more efficient its capacity of playing significant intermediation role in both domestic and international markets for funds. There are two alternatives proxy measures for this variable which are used by different researchers. The first one is domestic credit to private sector to GDP as used by Anyanwu (2011) and Ibrahim et al. (2011), the second

one is the broad money supply to gross domestic product as proxy measure for the variable and claimed as traditional measure of the variable (Giuliano and Ruiz-Arraz ,2009, Calderon and Liu, 2003). In this study, the former approach seems more reasonable to show the existence of financial transaction, and then we adopted for the measurement of the variable of interest, and the ratio infers that a larger financial sector has positive effect on FDI flow.

3.2.3 Empirical specification

Since this study covers most of SSA countries from the period 1994-2010, the appropriate modelling strategy, as mentioned before is panel data analysis. In panel data analysis the existence of unobservable country-specific effect are to be taken into account, the empirical specification in this study as often used in FDI location studies, and the static version of the empirical model is:

$$FDI_{it} = \beta_0 + \beta'_1 I_{it} + \beta'_2 X_{it} + \omega_{it} \quad \ldots\ldots (4)$$

Where FDI_{it} is the FDI inflows in % of GDP in country i at the time t, I_{it} is a vector of Institutional quality (hypothesis) variables which include three of the variables (control of corruption, rule of law, regulatory quality and their composite average), and X_{it} is a vector of stylized (control) variables. The error term, ω_{it} contains both unobserved country effect and the well behaved error with a zero mean and constant variance. That is,

$$\omega_{it} = \alpha_i + \varepsilon_{it} \quad , \quad \varepsilon_{it} \sim iid\ (0, \sigma_\varepsilon^2).$$

This study also uses dynamic model version of equation (4), the lagged net inward FDI is included as an explanatory variable. Despite its econometric problem, this model version is used to capture the ***Agglomeration effect (AG)*** on FDI flow. As studied by Matthieu *et al.* (2002), there was very strong evidence that positive spillovers between firms and agglomeration effect could have positive outcome on FDI flow in France. Similar study by Wheeler and Mody (1992) confirmed that the importance of agglomeration on FDI flow in US, and they concluded that if there was a positive feedback effect, once the initial flow of FDI set in, it should perpetuate itself and attracted more FDI inflow to the host country. Ben-Taher and Giorgioni, (2007) identified

also a positive and significant coefficient of lagged stock of FDI might support the hypothesis that there was evidence of agglomeration economies. Based on these facts and several studies, the use of dynamic version of the above static model helps to understand the agglomeration effect on FDI flow, and positive sign is expected from regression result. For this reason, the dynamic version of above equation (4) would be:

$$FDI_{it} = \beta_0 + \gamma FDI_{it-1} + \beta'_1 I_{it} + \beta'_2 X_{it} + \omega_{it} \quad \ldots\ldots (5)$$

As aforementioned in the preceding section, this study investigates the impact of institutional variables and other stylized factors on FDI flow in SSA. It is hypothesized that the foreign investors favourably perceive in particular countries with a good quality of institution, and other traditional factors. Therefore, taking into account the variables described above, and by applying log on both sides of equation (5), subsequently it could be re-written as:

$$lnFDI_{it} = \beta_0 + \gamma lnFDI_{it-1} + \beta_1 lnINS_{it} + \beta_2 \ln(GDP/CAP_{it}) + \beta_3 lnOP_{it} + \beta_4 lnINFR_{it} + \beta_5 lnNRS_{it} + \beta_6 lnFD_{it} + \beta_7 lnINFL_{it} + \beta_8 lnREX_{it} + \omega_{it} \quad \ldots\ldots (6)$$

$$i = 1,2,\ldots.32, \qquad t = 2.3,\ldots 17$$

Where, β_i are the parameters to be estimated, FDI is the FDI in % of GDP, INS represents institutional quality variables: rule of law, control of corruption, regulatory quality and their composite average ; GDP/CAP is the Gross National Income per capita , OP is openness of the economy, INFR is infrastructure, NRS is host nation natural resource, FD is financial development, INFL is inflation, REX is real effective exchange rate, and agglomeration effect is captured by FDI_{it-1} (the lagged net inward FDI). The composite error term ω_{it} is as described above. The proxy measure of each of these variables, their sources, and their expected effect on FDI are summarized in appendix-B table (4).

3.2.4 Estimation Techniques

In order to estimate the parameters of models, we employ the OLS and GLS methods of estimation for our static model, and Generalized Methods of Moments (GMM) technique for the dynamic version of the model.

3.2.4.1 Static Panel Model Estimation Procedure

In static model a fixed effect and random effect Model can be specified for regression analysis that depend upon the assumptions made about α_i, country specific effect. In the fixed effects model the intercept(α_i) terms vary over the individual units, it is also assumed that it remained fixed. If some interest falls on the country specific effect, it can be captured by fixed effect model which includes countries specific dummies. Hence, a general equation for fixed effect model can be written as:

$$y_{it} = \sum_{i=1}^{N} \alpha_i d_{ij} + X'_{it}\beta + \varepsilon_{it} \quad \ldots\ldots (7)$$

This fixed effects model can be specified in our study as follows:

$$FDI_{it} = \sum_{i=1}^{N} \alpha_i d_{ij} + \beta'_1 I_{it} + \beta'_2 X_{it} + \varepsilon_{it} \quad \ldots\ldots (8)$$

The α_i are individual intercept terms vary over the individual units *i*, and $\varepsilon_{it} \sim N(0, \sigma_\varepsilon^2)$. Where, $d_{ij} = 1 \; if \; i = j \; and \; 0 \; otherwise.$ $i = 1,2, \ldots \ldots N$, we thus have also a set of N dummy variables in the model. The I's and X's are vector of explanatory variables as described above. The parameters $\alpha_1 \ldots \alpha_N$, *and* β_i which referred as the least squares dummy variable (LSDV) estimator can be estimated by ordinary least squares in (8).

It may, however, be numerically unattractive to have a regression model with so many regressors. In addition this will have effect on reducing our degree of freedom. Such problem can be alleviated by performing the regression in deviation form. That is a regression model can be written in deviations from individual means (difference within individual), and does not include the individual effects α_i . Thus, our model has the form:

$$FDI_{it} - \overline{FDI_i} = \beta'_1 (I_{it} - \bar{I}_i) + \beta'_2 (X_{it} - \bar{X}_i) + (\varepsilon_{it} - \bar{\varepsilon}_i) \quad \ldots\ldots (9)$$

$i = 1,2, \ldots 32, \quad t = 1,2, \ldots .17$

A general condition for fixed effect or within estimator holds also for our model (9) that estimators are consistent for β for $T \to \infty$ or N$\to \infty$, provided that $E\{(X_{it} - \bar{X}_i)\varepsilon_{it}\} = 0$, $E\{(I_{it} - \bar{I}_i)\varepsilon_{it}\} = 0$. Thus, from this transformed model, we can determine the ***fixed effects estimators (within estimators)*** by the usual OLS method, which are exactly identical to the LSDV estimators described above.

In case of the Random Effects Model, it is commonly assumed in regression analysis that all factors that affect the dependent variable, but that have not been included as regressors, can be appropriately summarized by a random error term. In our case, this leads to the assumption that the α_i are random factors, independently and identically distributed over individuals. The general form of random effect model can be written as:

$Y_{it} = \mu + X'_{it}\beta + \alpha_i + \varepsilon_{it}$ ..... (10)

$\alpha_i \sim N(0, \sigma_\alpha^2)$, $\varepsilon_{it} \sim N(0, \sigma_\varepsilon^2)$.

Where, $\alpha_i + \varepsilon_{it}$ is treated as an error term consisting of two components: an individual specific component, which does not vary over time, and a remainder component, which is assumed to be uncorrelated over time. That is, all correlation of the error terms over time is attributed to the individual effects α_i. Thus, our random effect model can be specified in this Study as:

$FDI_{it} = \mu + \beta'_1 I_{it} + \beta'_2 X_{it} + \alpha_i + \varepsilon_{it}$ .....(11)

$i = 1,2, \ldots 32, \quad t = 1,2, \ldots .17$

In order to estimate the parameters of mode (11) we regress individual average of FDI on individual average of I's and X's (performing cross individual regression), it include the individual effects α_i , and it has the form:

$\overline{FDI}_{i.} = \mu + \beta'_1 \bar{I}_{i.} + \beta_2 \bar{X}_{i.} + \alpha_i + \bar{\varepsilon}_i$ .....(12)

$i = 1,2, \ldots .32$

The general condition of between estimator hold for our model, It should be consistent for $T \to \infty$ or N$\to \infty$, under the combined conditions of $E\{\bar{x}_i \alpha_i\} = 0, E\{\bar{I}_i \alpha_i\} = 0$ and $E\{\bar{x}_i \bar{\varepsilon}_i\} = 0$. $E\{\bar{I}_i \bar{\varepsilon}_i\} = 0$. This estimation method effectively discards the time series information in our data

set. Thus, by exploiting by the between dimension of the data (differences between individual countries), the ***parameter β's (between estimators)*** can be determined also by the OLS method.

However, the error components structure in random effect model (11) implies that the composite error term $\alpha_i + \varepsilon_{it}$ exhibits a particular form of autocorrelation (if $\sigma_\alpha^2 \neq 0$). As the result, the routinely computed standard errors for the OLS estimator are spurious. This affects the consistency of the estimators. Instead, we use the ***Generalized Least Square (GLS)*** estimator which combines the information from the within dimensions and between dimension more efficiently than either of the two estimators (within and between estimators). It is consistent for $T \rightarrow \infty$ or N$\rightarrow \infty$, under the combined conditions of within and between estimators.

On the other side, the arguments of consistency and efficiency for choosing between a fixed or random effects falls on the treatment of α_i, whether to treat the individual effects α_i as fixed or random is not an easy question to answer. The appropriate interpretation is that the fixed effects approach is conditional upon the values for α_i. That is, it essentially considers the distribution of y_{it} given α_i, where the α_i's can be estimated. In contrast, the random effects approach is not conditional upon the individual value of α_i's, but just focus on arbitrary individuals that have certain characteristics. One way to formalize this is noting that the random effects model states that,

$E\{ y_{it} / x_{it,}\} = x'_{it}\beta$, while the fixed effects model estimates

$E\{ y_{it} / x_{it,}\alpha_i\} = x'_{it}\beta + \alpha_i$.

The β coefficients in these two conditional expectations are the same only if

$E\{ \alpha_i / x_{it,}\} = 0$

Thus, one may prefer the fixed effect estimator or random effect estimator which depends on the condition of α_i and x_{it}. If the number of units is relatively small and of a specific nature of identification of individual effect is important for the estimation the fixed effect model is preferred. If it is assumed that α_i and the explanatory variable are uncorrelated, the random effect may be appropriate; otherwise the fixed effect may be appropriate (Gujarat, 2004, Verbeek, 2004). Despite these conditions, to choose either of the two models we use the Hausman (1978) test. In fact the Hausman test, thus tests the null hypothesis that the coefficients estimated by the

efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator. Hence, after running both fixed effect (within dimension) and random effect (cross country regression) models, we retain one of the models based on results of the test hypothesis.

3.2.4.2 The Dynamic Panel Model (GMM estimator) Procedure

In our dynamic model (5), the lagged net inward FDI is included as an explanatory variable to describe dynamism of the model. However this inclusion of lagged variable points out the possibility of correlation between the explanatory variables and ω_{it}, and it depends on the country specific effect irrespective of the way we treat α_i. The existence of this endogeniety and correlation causes the dynamic version of the model from the Nickell (1981) bias (Baltagi et al, 2009). As Blundell and Bond (1998) suggest that in the presence of country specific effect and endogeniety problem in the dynamic version of the model, OLS method of estimation could lead into inconsistent and biased estimates. Similarly, Bond (2002) revealed that, if the covariance of individual effect and explanatory variables is different from zero, OLS method of estimation would lead to inconsistency.

To understand this argument, let's consider a case of autoregressive panel model in which the first difference used as explanatory variable and including individual effect as given below:

$$Y_{it} = \gamma Y_{it-1} + \alpha_i + \varepsilon_{it} \quad \ldots\ldots (13)$$
$$|\gamma| < 1, \quad i = 1, 2, \ldots N, \; t = 2, 3, \ldots T$$

In this case, if the observations are independent across individual i, the following conditions should be expected:

$$E\{\alpha_i\} = 0, \qquad E\{\varepsilon_{it}\} = 0\,, \qquad E\{\alpha_i \varepsilon_{it}\} = 0 \quad for\ i = 1,2, \ldots . N, \qquad t = 2,3 \ldots . T$$

$and\ E\{\varepsilon_{is}\varepsilon_{it}\} = 0\,, \quad for \forall\ t \neq s$, and the initial condition is also given by:

$E\{Y_{it}\varepsilon_{it}\} = 0\,, \quad for\ i = 1, 2, \ldots N \quad t = 2, 3, \ldots T$

T0 solve the inconsistency problem, we first of all start with a difference transformation to eliminate the individual effects α_i, in particular we take first differences:

$$Y_{it} - Y_{it-1} = \gamma(Y_{it-1} - Y_{it-2}) + (\varepsilon_{it} - \varepsilon_{it-1}) \quad \ldots\ldots (14)$$

$for\ t = 3, 4, \ldots T$

As claimed above if we estimate this by OLS we do not get a consistent estimator for γ because Y_{it-1} and ε_{it-1} are, by definition, correlated, even if $T \to \infty$. However, this transformation suggests an instrumental variables approach. For example, Y_{it-2} is correlated with $Y_{it-1} - Y_{it-2}$ but not with ε_{it-1} unless ε_{it} exhibits autocorrelation (which we excluded by assumption). Thus, the parameter γ can be estimated by IV approach.

On the other hand, all the above initial condition together with IV estimators approach is implying the following moment restrictions:

$E\{(\varepsilon_{it} - \varepsilon_{it-1})Y_{it-2}\} = 0$, for t=3, …,T is sufficient for estimation of γ.

$$E\{(\varepsilon_{it} - \varepsilon_{it-1})(Y_{it-2} - Y_{it-3})\} = 0$$

As we have observed above first differencing method, which is the Arellano and Bond (1991) Generalized Method of Moment (GMM) approach eliminates the individual specific effects and use lagged instruments to correct for endogeniety problem; and they also argued that the list of instrument can also be extended and by exploiting additional moment conditions so that it is possible to increase the efficiency of the estimators.

However, when the number of time series observations is small, the first-differenced GMM may behave quite poorly because lagged levels of the variables are only weak instruments for subsequent first-differences (Bond et al., 2001).

On top of that, although the GMM developed by them is a means to avoid the problem that arise when dealing with dynamic models, may suffer from series finite sample biases because there is a possibility of using weak instrument for even completely uninformative instrument in our regressions model . If the instrument variable exhibits only weak correlation with endogenous

regressor (s), the instrument estimator can be very poor, the instrument can be severely biased estimator, even if the sample size is very large. As the result, the standard IV estimator is biased, its standard error is misleading and the hypothesis test is unreliable.

This problem may be alleviated by introducing the system GMM estimator suggested by Arellano and Bover (1995) and Blundell and Bond (1998). Under the additional assumption that first-differences are not correlated with country-specific effects, the basic idea of system GMM is to combine both equations in first-differences, taking the lagged level variables as instruments, with equations in levels with lagged first-differences as instruments. To illustrate, considering a simple AR(1) model:

$$Y_{it} = \gamma Y_{it-1} + \beta' X_{it} + \alpha_i + \varepsilon_{it} \quad \ldots\ldots (15)$$

$$for\ i = 1 \ldots . N, t = 2, \ldots . T$$

Here, the vector X_{it} is the regressor used in the system may be endogenous, predetermined or exogenous. As with the lag of the dependent variable, for both predetermined and endogenous variables, we need to use the lag levels as instruments for (15). Thus, depending upon the assumptions made about X_{it} different sets of additional instruments can be constructed.

For instance, if the X_{it} are strictly exogenous in the sense that they are uncorrelated with any of the ε_{it} error terms, we also have condition that $E\{X_{is}\ \varepsilon_{it}\} = 0$ for each s, t so that the first-differenced X_{it}'s are used as their own instruments. The additional moment condition would be: $E\{\Delta X_{it-s}\ \Delta\varepsilon_{it}\} = 0$ for each t.

If X_{it} is treated as and endogenous and correlated with α_i so as to satisfy $E\{X_{it}\varepsilon_{is}\} \neq 0\ for\ i = 1, \ldots N\ and\ s \leq t$, we were to use X_{t-1}, as instrument for ΔX_t, then this would necessarily be correlated with error term, and so it could not be used as a valid instrument. So, we can only use levels dated prior to $t - 1, i.e. X_{t-2}, X_{t-3}$ ... etc. as instrument. Then the two moment conditions for system GMM are:

$$E\{X_{it-s}\Delta\varepsilon_{is}\} = 0\ for\ t = 3, \ldots . T, i = 1,2 \ldots ., N\ and\ s \geq 2$$

$$E\{\Delta X_{it-s}\varepsilon_{is}\} = 0 \; for \; t = 1, \ldots T, i = 1, \ldots, N$$

If the X_{it}variables are not strictly exogenous but predetermined, in which case current and lagged X_{it}'s are uncorrelated with current error terms, we only have that $E\{X_{it}\,\varepsilon_{is}\} = 0$ $for\ each\ s \geq t$. In this case, only $X_{it-1}, \ldots\ldots\ X_{i1}$ are valid instruments for the first-differenced equation in period t. Thus, the moment conditions that can be imposed are:

$$E\{X_{it-j}\,\Delta\varepsilon_{it}\} = 0 \;\; for\, j = 1, \ldots \;\; t-1 \, for \; each \; t$$

In general, the system GMM estimation procedure allows us to directly address several econometric problems. First, as in other fixed-effect panel estimators, the system GMM method enables us to consider the presence of unobserved country-specific effect due to difference in the initial conditions, or possible bias of omitted variables that are persistent over time. As mentioned by Islam(1995), following differences in the steady state (through fixed individual country effect) enables us to account for divergence among countries that were estimation increases the degree of freedom and reduces collinearity between variables, leading to more efficient estimates.

Nevertheless, the system GMM method shows certain weakness that is primarily related to the goodness of their instruments and to the accuracy of the initial assumption of no autocorrelation in error terms. Hence, as suggested by Arellano and Bond (1991), it is necessary to verify the consistency of the estimates through two tests for correct specification. These are the Sargan test of over-identifying restriction (validity of the entire instruments used in the model), and test of serial correlation in errors.

First, a fundamental assumption for the validity of GMM is that the instruments are exogenous. In this case, if Z_j is an instrument (number of instruments running from j=1, 2, ..., M, used in the model and ε_{it} is the error term, Sargan test testes the joint null hypothesis that, $E\{Z_j\varepsilon_{it}\} = 0$ for $\forall j \in \{1,2, \ldots . m\}$. Second, in our testing of serial correlation we expect for $E\{\varepsilon_{is}\varepsilon_{it}\} = 0, for \; \forall \; t \neq s$. Here, we may reject the first order autocorrelation of the error terms, since successive error terms might be autocorrelated. We will expect, however, the average second

order autocovariance of the residual will be zero otherwise we would have evidence of model misspecification implying that the instruments are invalid.

3.3 Diagnostic Tests

3.3.1 Multicollinearity Test

It is common to test if there is multicollineraity among explanatory variables before estimation and interpretation of the regression model performed. The presence of multicollinearity results may lead to unreliable estimates with high standard errors and unexpected sign or magnitude or unreliable regression estimates, which makes our estimates spurious (Greene, 2003). A variance inflation factor (VIF), for each coefficient in a regression used as a diagnostic statistic to detect multicollinearity problem in our model.

3.3.2 Panel Unit Root Test

In stationery time series, shocks will be temporary and over time their effects will be eliminated as the series revert to their long run mean values. On the other hand, non stationary series will contain permanent components. In fact, most of the economic variables show a trend and therefore in most cases they are not stationery. These non stationaType equation here.ry time series can easily lead the regression results to incorrect or spurious conclusions. Thus, a key way to test for non-stationarity is to test for existence of unit root. Testing for unit roots in time-series studies is now common practice among applied researchers and has become an integral part of econometric courses.

However, testing for unit roots in panels is recent (Baltagi, 2001, Levin and Lin, 1992). Many researchers proposed different test method, starting from the traditional Augmented Dickey-Fuller (ADF)-type tests of unit root which suffer from the problem of low power in rejecting the null stationarity of the series, especially for short –spanned data. Recent studies show that panel-based unit root tests have higher power than unit root tests based on individual time series. The widely used tests applied in a number of recent studies include Levin and Lin (1992, 1993), Levin et al. (2003), Im, Pesaran and Shin (IPS) (2003). The work of Levin and Lin assumes that

individuals in the panel have identical first order partial autocorrelation while all other parameters are permitted to vary across individuals. Their test procedure is designed to evaluate the null hypothesis that each individual in the panel is non-stationery against the alternative hypothesis that all individuals are stationery.

Alternatively, Im et al.(2003) proposes testing procedure by relaxing the restrictive assumption of Levin and Lin by allowing heterogeneity on the coefficient on the first order. They propose their test based on the average of Augmented Dickey-Fuller (ADF) statistic computed for each group in the panel. Since their test allows for heterogeneity among individuals, this gives their test superior power performance as compared to Levin and Lin. The test is described as a "Heterogeneous panel Unit Root Test". Thus, in this study the test procedure by Im et al. (2003) is used to test panel unit root for each individual's series as specified below. IPS starts by specifying a separate ADF regression for each cross section:

$$\Delta y_{i,t} = \alpha_i + \phi_i y_{i,t-1} + Z'_{it}\,\rho_i + \varepsilon_{i,t} \quad \ldots\ldots (16)$$

Where, $y_{i,t}$ (i=1,2,.....N, t=1,2,.....T) is the series for panel member (country) i over period t, p_i is the number of lags in the ADF regression, and the error terms $\varepsilon_{i,t}$ are assumed to be independently and normally distributed random variables for all i's and t's with zero means and finite heterogeneous variances σ_i^2 across panels. Both ϕ_i and ρ_i (16) are allowed to vary across sections (countries). Hence, the null hypothesis to be tested is:

H_o: ϕ_i=0,$\forall i$ against the alternative hypothesis:

$$H_1: \begin{cases} \phi_i = 0 & \text{for some i's} \\ \phi_i < 0 & \text{for at least one i} \end{cases}$$

Under the null hypothesis that all panels contain a unit root, the alternative is that the fraction of panels that follow stationary processes is nonzero; i.e., as N tends to infinity, the fraction N1=N converges to a nonzero value, where N1 is the number of panels that are stationary.

3.3.3. Panel Co-integration Test

The co-integration test is performed to determine the existence of long relationship between the variables of interest. The testing of hypothesis is null for non co-integration against the alternative hypothesis with the existence of co-integration. The Johansen's test of co-integration (Johansen, 1998) is usually used for co-integration test. The estimated co-integration equation is the following form:

$$Y_{it} = \beta_{i1}X_{i1t} + \beta_{i2}X_{i2t} + \ ... + \beta_{ik}X_{ikt} + \varepsilon_{it} \quad \ldots\ldots (17)$$

The equation can be written as:

$$\varepsilon_{it} = Y_{it} - (\beta_{i1}X_{i1t} + \beta_{i2}X_{i2t} + \ ... + \beta_{ik}X_{ikt}) \quad \ldots\ldots (18)$$

$$for\ i = 1, 2, \ldots . N \quad and\ t = 1,2, \ldots T$$

Johansen's procedure with country-by-country pure time series data is useful in conducting individual co-integration tests. Since, however, the size and the power properties of Johansen's test with small sample sizes can be severely distorted, a panel cointegration test developed by Pedroni (1999a, 2004) is preferred. He provides a technique that allows for using panel data and thereby overcoming the problem of small samples, in addition to allowing for heterogeneity in the intercepts and slopes of the co-integration equation. Let us consider the following panel regression:

$$Y_{it} = \alpha_i + \beta'_i X_{it} + \omega_{it} \quad \ldots\ldots (19)$$

$$for\ i = 1,2, \ldots 32, and\ t = 1,2 \ldots 17$$

Where, ω_{it} represents the disturbance term from the panel regression, α_i refers country-specific fixed effects and the coefficient of β_i allows the variation across individual countries, X_{it} is a vector explanatory variables and $X_{it} = X_{it-1} + \varepsilon_{it}$ denote the series of estimated residual from regression (19),which follows the autoregressive process as:

$$\varepsilon_{it} = \rho_i \varepsilon_{it-1} + \omega_{it} \quad \ldots\ldots (20)$$

Where, ρ_i and ω_{it} are the coefficient and estimated error terms respectively.

Pedroni's ***between-dimension*** statistic is constructed with the null of no cointegration ρ_i =1 against the alternative hypothesis $\rho_i < 1$ for all i. That is:

$H_o : \rho_i = 1, \forall i$

Against the alternative hypothesis,

$H_1 : \rho < 1, \forall i$

Under alternative hypothesis, the between-dimensional estimation does not assume a common value $\rho_i = \rho$ that means it allows an additional source of possible heterogeneity across individual country members of the panel.

In contrast, the alternative hypothesis for within-group statistics is $\rho_i = \rho$, in other word the null hypothesis test for ***within-dimension estimation*** is given as:

$H_o : \rho_i = 1, \forall i$

Against the alternative hypothesis:

$H_1 : \rho_i = \rho < 1, \forall i$

Here, under alternative hypothesis, the within –dimension estimation assumes a common value for : $\rho_i = \rho$. That means it does not allow an additional source of possible heterogeneity across individual country member of the panel.

Accordingly, the between-group mean statistic allows for a more flexible alternative hypothesis. It allows for the short-run dynamics, fixed effects, and even the cointegrating vectors to differ across panel members under the alternative hypothesis of a single cointegrating vector (Pedroni, 1999a).

On the whole, Pedroni suggests two types of tests to know the existence of heterogeneity of co-integration vector. First, it is the test based on within-dimension approach (i.e., panel test) which includes for statistics such as panel v-statistic, panel ρ –statistic, panel pp-statistic and panel ADF-statistic. These statistics pool the autoregressive coefficients across different members for the unit root tests on estimated residuals. The second test is based on between –dimensional approaches (group test). It includes three statistics such as group ρ -stattitsics, group pp-statistic and group ADF-statistic. These statistics are based on estimators that simply average the individually estimated coefficients for each member.

For a small sample size, the test based on the group ADF statistic is the most powerful, followed by the test based on the panel v-statistic. (Pedroni, 1999a, 2004). Thus, for this study we will adopt group ADF-statistic as criteria of accepting or rejecting the null hypothesis.

3.3.4 Granger Causality Test

To determine the causality between institution and foreign direct investment, the Granger-based causality test is used. Following Granger (1969), if there are two variables X and Y, causality may run from X to Y, or X causing Y, if after controlling for the information in the past value of Y, the past value of X adds significantly to the explanation of current Y, we can say that X Granger causes Y. Similarly, if we control for the information in the past value of X and the past value of Y add significantly to the explanation of current X, then we can say that Y Granger causes X. If only one of these relationships is true, this signifies unilateral causation. But if both hold, true bilateral causation exists between variables. Such approach is also used to test Granger causal relationship between institutions and foreign direct investment. Following the Granger method the causal relationship between institutions and foreign direct investment can be specified dynamically as follows.

Foreign direct investment as a cause for institutional quality (INS→ FDI) and institution as a cause for foreign direct investment (FDI→INS) are specified in equation (21) and (21) respectively.

$$FDI = \sum_{z=1}^{Z} \gamma_z FDI_{i\,t-z} + \sum_{l=1}^{L} \alpha_l \, INS_{i\,t-l} + \pi_i + \omega_{it} \quad \text{.....(21)}$$

$$INS = \sum_{k=1}^{K} \delta_k INS_{i\,t-k} + \sum_{s=1}^{S} \tau_s \, FDI_{i\,t-s} + \theta_i + u_{it} \quad \text{.....(22)}$$

Where $i = 1, \ldots .32$ and $t = 1, \ldots 17$ and FDI is foreign direct investment and INS is institutional quality in a country i over a period t. π_i and θ_i on the above equations are country specific effects and ω_{it} and u_{it} are random error terms. Z, L, K and S are appropriate lagged values to be chosen and γ, α, δ and τ are estimated parameters.

To test the causality between the two variables: FDI and INS, we used the Wald causality test will be employed. The null and alternative hypotheses of the above equations stated as follows:

For equation (21):

$H_o: \gamma_z = 0$ against

$H_1: \gamma_z \neq 0$,where z=1,2.....Z

Similarly for equation (22)

$H_o: \tau_s = 0$ against

$H_1: \tau_s \neq 0$, Where s=1,2.....S

In the above tests if one of the two tests is failed to be rejected, we can say that there is unidirectional causation. However, if the two hypotheses are rejected, there is bidirectional relationship between foreign direct investment and institutional quality. If both hypotheses are rejected, then two variables have no any causal relationship, and this provides feedback and they could be determined endogenously.

Chapter Four

Results and Discussion

4.1 Diagnostic Tests Results

4.1.1 Results of Multicollinearity Test

Like other diagnostic test, before proceeding estimation and interpretation of the regression models, it is imperative to test the multicollinearity of the independent variables. The output of table (1) below shows the variance inflation factors together with their reciprocals. Based on different analysts like Maddala (1992) and Gujarati (2004), we can compare the reciprocals with a predetermined tolerance. In the comparison, if the result of VIF each variable is greater than 10 or the corresponding reciprocal of the VIF of is smaller than 0.1 there is evidence of multicollinearity. In addition to this comparison Chatterjee and Hadi (2006) proposed that the mean of all the VIFs is considerably larger than 1. On both cases the results show that no evidence of multicollinarity problem in our independent variables.

Table-1: Multicollinearity Results

Variable	VIF	1/VIF	Variable	VIF	1/VIF
Ln_INFR	6.23	0.160613	Ln_INFR	6.21	0.161125
Ln_ GDPP	3.47	0.287955	Ln_ GDPP	3.64	0.275085
Ln_ OP	2.26	0.442195	Ln_ OP	2.14	0.468123
Ln_NRS	1.69	0.592872	Ln_NRS	1.60	0.626776
Ln_FID	1.60	0.626558	Ln_FID	1.58	0.633572
Ln_REXR	1.35	0.740391	Ln_INS	1.54	0.651279
Ln_INFL	1.10	0.911802	Ln_REXR	1.30	0.766994
Ln_RQ	1.31	0.762366	Ln_INFL	1.10	0.912093
Ln_CC	1.10	0.905034	**Mean VIF**	**2.39**	-
Ln_RL	1.10	0.905118	-	-	-
Mean VIF	**2.12**	-	-	-	-

4.1.2 Panel Unit Root Result

The first task before estimating the regression equations there should be to a test of stationariety or non-stationariety of the variables understudy. As mentioned before, we used panel unit root test developed by Im pesaran and Shin (2003) which allows each member to have different autoregressive parameter under the null hypothesis. That is the null hypothesis of (IPS) tests is that all countries have a unit root for the variable against the alternative that some-cross-sections are without unit root. The results for this test are described in the following tables (2) and (3).

Table -2: Panel Unit Root Test Result for Level Variables

Variables in level	With only individual effect	With individual effects and time trend
	IPS Statistic	IPS Statistic
Ln_FDI	-2.9013***	-3.1225***
Ln_CC	-1.9801***	-2.1931
Ln_RL	-1.7854**	-2.474**
Ln_RQ	-2.4778***	-2.855***
Ln_INS	-1.6330	-2.0520
Ln_GDPP	-0.1657	-1.7827
Ln_INFR	-1.7060*	-1.8868
Ln_OP	-1.6357	-2.4371**
Ln_NRS	-2.2807***	-2.6946***
Ln_FID	-3.4498***	-4.0436***
Ln_INFL	-3.1930***	-3.1897***
Ln_REXR	-1.6179	-1.9090

Notes: the fixed-N exact critical values for only individual effect 1% , 5% and 10% are (-1.830 , -1.740 and -1.690) , and for individual effects and time trend are (-2.480 -2.380 and -2.330) respectively.

*The sign ***, ** and * signify the significance of the variables at 1%, 5% and 10% levels respectively.*

Based on Im-Pesaran-Shin (2003) unit-root test, the results in table (2) show that we strongly reject the null hypothesis that all countries for natural logarithm of the variables: foreign direct investment, financial development, inflation and natural resources for both individual and individual- time trend effects, contain unit root in favor of the alternative that the panels represent stationery process. Similarly the null hypothesis of the variable control of corruption contains unit root with only individual effect rejected at lower level in favor of the alternative that the panel is stationary. Correspondingly, the null hypothesis for natural logarithm of the variables, openness, regulatory quality and rule of law with individual and time trend effect and infrastructure with individual effect only is rejected at 5% and 10% levels respectively.

However, the variables for natural logarithm of GDP per capita, institutional quality and real effective exchange rate have no evidence to reject the null hypothesis. When the variables are non –stationary, another option should be undertaken. That is the variables can be tested for unit root tests in first difference; the results of the first differenced variables are reported in table (3).

Table -3: Panel unit root test for differenced variables

Variables in Difference	Result with only individual effect	Result with individual effects and time trend
	IPS Statistic	IPS Statistic
ΔLn_CC	-3.4813***	-3.5061***
ΔLn_INS	-3.5153***	-3.6127***
ΔLn_GDPP	-2.6712***	-2.8721***
ΔLn_INFR	-3.0336***	-3.1833***
ΔLn_OP	-3.9402***	-3.9852***
ΔLn_REXR	-2.4887***	-2.5825***

Notes: the fixed-N exact critical values for only individual effect 1% , 5% and 10% are (-1.830 -1.740 -1.690) , and for individual effects and time trend are (-2.480 -2.380 -2.330) respectively

The sign *** denotes the significance of the variables at 1%, 5% and 10% levels respectively

Here, under the first differencing case all variables are stationary; all the test statistics are less than even at 1% significance level. Thus, the null hypothesis that there is unit root in a series of

variables is strongly rejected for natural logarithm of control of corruption, institutional quality, GDP per capita infrastructure, openness and real effective exchange rate. In general the unit root tests in the first case shows that the variables which are stationary at I(0) (integrated of order zero) are at a level, whereas all other level variables which become stationary after first differencing are I(1) (integrated of order one), however their first difference become I(0).

4.1.3 Results of Panel Co-integration Tests

If some variables in the model are non-stationary, then there could be some long run relationship among the variables. Based on the results from unit test, GDP per capita and institutional index are found to be integrated of order one, I(1). Thus, two variables might have long run relationship, as our center of attention is to check long run relationship between institutional variables and FDI. To verify whether these variables have long-run relationship between them we employed the Pedroni test as suggested in the previous section. Table (4) depicts the test result and it shows that both institutional quality and foreign direct investment are co-integrated, as from the total Pedroni test of statistical results, four of them reject for the null hypothesis no co-integration for institutional quality and foreign direct investment which implies that the existence of long run relationship /trend between the two variables..

Table- 4: Pedronie Panel Co-integrstion Test Result

Panel v-statistics	Statistics	P-value
Panel rho-statistics	-2.310256	1.0000
Panel pp-statistics	1.349402	0.0123
Panel ADF-statistics	-4.210960	0.0024
Group ADF-statistics	3.436610	1.0000
Group rho-statistics	-5.089262	0.0000
Group pp-statistics	-8.233091	0.0000

4.1.4 Results of panel Causality Tests

If the two variables are co-integrated, at least the causality runs in one direction. In this section the causality of institutional quality and foreign direct investment would be discussed. Following Granger causality condition, the dynamic representations of equation (21) and (22) would be estimated by accounting for endogeneity problem using system GMM estimation technique. Each of these equations was estimated and the significance of the coefficients of the lags of the variables was tested by Granger Wald causality test to determine the kind of causality between foreign direct investment and institutional quality.

When we consider the results of the two tests for the two equations, in the first test in the first row depicts that we failed to accept a Wald test for the coefficients on the two lags of INS that appear in the equation for FDI are jointly zero, so we reject the hypothesis that INS does not Granger causes FDI. Similarly the result in second test first row shows that the null hypothesis that the coefficients on the two lags of FDI that appear in the equation for INS are not jointly zero, so we can also reject the hypothesis that FDI does not Granger causes INS. On top of these in both tests, we can also reject the null hypotheses that lags of INS and FDI jointly do not Granger-cause FDI and INS.

Table -5: Granger Causality Wald Test Results

Equation	Excluded	Chi2	P-value
FDI	INS	5.8536	0.054
	ALL	5.8536	0.054
INS	FDI	7.1287	0.028
	ALL	7.1287	0.028

In general, the results point out that for SSA countries there is causal relationship between the institutional quality and foreign direct investment, and the causality is running in both directions in all test cases. So, it is confident to say that there is bi-directional relationship between foreign direct investment and institutional quality. This result is also consistent with previous findings of Hyun (2006).

4.2 Descriptive Analysis

This section tries to highlight the descriptive nature of the variables under consideration. Table (6) shows the summary statistics of the variables included in our estimated model.

Table- 6: Summery Statistics

Variable		Mean	Std. Dev	Min	Max
FDI	**Overall**	**3.40**	**5.19**	**-8.59**	**43.82**
	Between		3.10	0.16	13.70
	Within		4.19	-6.69	40.54
CC	**Overall**	**-0.48**	**0.55**	**-1.48**	**1.26**
	Between		0.51	-1.22	0.89
	Within		0.22	-1.20	0.61
RL	**Overall**	**-0.52**	**0.61**	**-1.84**	**1.02**
	Between		0.59	-1.49	0.93
	Within		0.18	-1.17	0.41
RQ	**Overall**	**-0.51**	**0.51**	**-2.25**	**0.85**
	Between		0.48	-1.81	0.61
	Within		0.19	-1.23	0.51
INS	**Overall**	**-0.50**	**0.51**	**-1.78**	**0.90**
	Between		0.50	-1.49	0.70
	Within		0.16	-1.16	0.35
GDPP	**Overall**	**1210**	**2006**	**87**	**11983**
	Between		1934	132	8693
	Within		628	-899	5650
INFR	**Overall**	**30.00**	**60.94**	**1.24**	**302.6**
	Between		60.15	2.29	242.34
	Within		14.25	-95.12	91.18
OP	**Overall**	**73.64**	**39.45**	**2.18**	**256.36**
	Between		37.55	31.86	178.51
	Within		13.48	2.81	151.53
NRS	**Overall**	**21.34**	**27.84**	**0.00**	**101.38**
	Between		24.76	0.05	82.47
	Within		13.42	-53.38	59.91
FID	**Overall**	**16.81**	**13.54**	**0.00**	**103.63**
	Between		11.19	4.36	60.54
	Within		7.88	-32.26	92.94
INFL	**Overall**	**58.76**	**1047**	**-8.24**	**24411**
	Between		279	3.36	1589
	Within		1011	-1524	22880
REXR	**Overall**	**574.22**	**957**	**0.01**	**9687**
	Between		746	0.68	3212
	Within		614	-1968	9027

Annual data 1994-2010, countries 32, observation: Institutional Variables =480, other variables=540

In table (6) of summary statistics, the overall mean, standard deviations, the minimum and maximum as well the within and between standard deviation, minimum and maximum of each variable are provided in the table. Making our discussion based on the overall summary statistics of each variable; the foreign direct investment has a great variation among the cross section with maximum value is depicted in Mauritania with value 43.82 percent during the year 2005 and Gabon had the minimum net FDI inflow a value of -8.59 during the year 1996, which shows that there was disinvestment with FDI outflows exceeding inflows.

Control of Corruption has index value of -0.48 in average which implies that there is prevalence of corruption in the region. There have been some improvement in some countries of the region; however, most of them have poor record in control of corruption on the past decade. For instance, Botswana(1.26), Mauritius(0.68), Seychelles(0.90) and Cape Verde(0.78) have relatively better records in curbing on corruption; to the contrary Cameroon(-1.18), Central Africa (-1.39), Cote d'Ivoire(-1.23), Sudan(-1.48) and Zimbabwe(-1.44) have poorest record in control of corruption among SSA countries within the study period. As whole, Botswana has a maximum record with a value of 1.26 in control of corruption in a year 2003 where as Sudan has a minimum record with a value of -1.48 during the year 2008, among SSA countries. With regard to rule of law the maximum value (1.02) evidenced in Mauritius during the year 2003 and the minimum value (-1.78) is seen in Zimbabwe in 2009, which implies that there is absence of impartiality in the legal system.

The variable regulatory quality has average value -0.51, the lowest value (-2.25) is found in Zimbabwe in the period 2005; there are also other five countries which have the lowest records among the sampled countries: Ethiopia (-1.34), Central Africa (-1.34), Ruanda (-1.47), Sudan (-1.47) and Burkina Faso (-1.68), during study period. This demonstrates inefficiency of the governments to provide sound policies and regulations that enable and promote private sector development. In contrast, Mauritius (0.85) and Botswana (0.79) have done better work in terms of this variable among countries of the region. The composite average of the three governance indicators (rule of low, control of corruption and regulatory quality) which we called it "institution" is depicted in fifth row. The mean of this variable is indexed -0.50. Botswana has a

maximum average value of 0.90 during the year 2003 whereas Zimbabwe has minimum record with a value of -1.78 in 2009, which indicates existence of worse institutional quality.

GDP per capita in current USD is used as a measure of economic performance, it has overall mean of 1210 USD and st.dev 2006, this indicates that there is a great variation among the cross-section. Seychelles has maximum value of 11983USD per capita during the year 2007, and Burkina Faso has a minimum value of 87USD in 2003. There are also other SSA countries like Botswana (7403USD), Mauritius (7598USD) and Gabon (10020USD) which all have relatively very high per capita income comparing to most countries of the region, and they are also characterized as middle income countries according to World Bank's world classification based on their income in 2001 report. Whereas countries, like Ethiopia (113USD), Mozambique (141USD) and Tanzania (180USD) recorded the lowest per capita incomes among SSA countries under the period studied.

Infrastructure, which is proxy measure of phone lines per 1000 inhabitants depicted in seventh row, with the overall mean of the variable is around 30, with Mauritius having the highest value of 300 and Ruanda has the least value of 1.24 during the years 2010 and 1995 respectively.
The variable Openness measured as export plus import to GDP has average value 73.64. The maximum value, 256.36 percent is recorded in Seychelles under the period studied. There are also other nations that have a better score in terms of this variable; Mauritania (130.96), Mauritius (132.20), Lesotho (170.90) and Swaziland (192.29); while the minimum value (14.61) is found in Sudan during the year 1994.

In terms of natural resource availability, which is measured as metal ores plus fuel export to total merchandize export, with the maximum value (101.38) is recorded in Zambia during the year 2008. Similarly, Sudan (95.04), Gabon(91.38), Guinea(83.27) and Mauritania (81.61) have exclusively highest proven fuel resources during the study period; whereas the least value (0.00) is recorded in Seychelles in 2003, 2004 and 2008, and in Cape Verde during the year 2007 and 2008. These counties are less endowed in natural resources, and they were not exporting fuel or ores during these periods.

The variable financial development measured as domestic credit to the private sector is placed in the tenth row, the mean of this variable is 16.81. The highest (103.63) and least (0.00) values are found in Zimbabwe during the study period which implies that there is inconstancy and mismanagement in the system. Other nations, like Mauritius (87.81 percent) and Cape Verde (41.72) have provided better domestic credit to private sectors which is an indicator of better financial system; in contrast Ethiopia (0.6 percent) and Sudan (0.65 percent) are among least providers of domestic credit to private sectors during the years 2010 and 1995 respectively.

Coming to inflation variable, in fact it has average value of 58.76. However, the maximum value, 24411 percent which is bizarrely found in Zimbabwe during the year 2007. Next to Zimbabwe Malawi (83.33 %) and Sudan (132.82%) have recorded the highest inflationary problem during the years 1995 and 1996 respectively. The minimum value (-8.24 percent) is found in Ethiopia during the year 2001. All these indicate existence of price instability in these countries. Looking at exchange rate, the average value is 574.22; the highest value (9686.77) and the minimum value (0.01) are found also in Zimbabwe during the year 2007 and 1994-1997 respectively. This shows how the nation's currency depreciates very suddenly on the past decade, this together with the above inflationary condition signify that a total collapse of the country's macroeconomic condition during the stated period. In contrast, countries such as, Gahanna (1.43) and Sudan (2.31) have shown the lowest exchange rate record during the year 2010, which indicates relatively low economic instability and have strong domestic currency.

The general trend of the variables which are depicted in appendix – C, the mean values of variables and time period for each series are shown along the vertical and the horizontal axes respectively. As shown in the figures, all institutional variables (control of corruption, rule of law, regulatory quality, and average of institutional indicators) vary across time period, and except the mean of the institution al variable (starting from 2005) show downward trend. Similarly the variables natural resource and inflation vary with time and illustrate downward trends. With regard to other variables, foreign direct investment and openness show variation in some periods but both depict upward trends. Exceedingly, Market size (GDP per capita), infrastructure, financial development, and exchange rate all have shown upward trends.

4.3 Empirical Results

In this section we present the results of econometric analysis of net foreign direct investment as percentage of GDP using an unbalanced panel[2] data for the 32 SSA sampled countries from the period 1994-2010. The basic set-up of the panel; however, does not cover a period of 17 annual observations for all variables; particularly the variables of institutional quality obtained from our data source are found from 1996 onwards.

In line with our estimation procedures, we run two econometric models: the fixed effects (within regression) model, which is retained based on Hausman (1978) test and system GMM model for both static and dynamic panel data analysis respectively. With regard to variables included in our models, we took only three main institutional variables of interest (control of corruption, rule of law and regulatory quality) and their composite average, which are believed to be the central part of the governance indicators. We included three of them at a time and then their composite average alone in order to avoid their correlation effect. We preferred this way because investigating the significance of each of these selected governance indicators and their composite average in our specified models would help to understand their individual and average's effects on FDI flows. In fact, arriving at conclusion based on only aggregation all governance indicators, for instance the situation of corruption, could conceal the individual effect of every indicator on FDI inflow and may also lead to wrong inference. The method also would help to check the robustness of the conventional variables that are treated in the models.

With regard to other explanatory variables, we used 'inflation' as lag variable in all models because its coefficient originally appears as positive results on both model types, which is inconsistent with the theory. On top of this, in our dynamic model it is allowed to use the level as instrument in addition to the dependent variables, for such case we followed the work of Baltagi et al. (2008) that we treated 'natural resource variable' as endogenous variable so that we utilized additional instruments as outlined in the previous section. Importantly, the treatment of the natural resource as endogenous does change the qualitative nature of the results. Specifically, it does alter the sign of the variable, which unlikely became negative in our original dynamic

[2] The unbalanced panel causes no problem if the missing data are not correlated with the idiosyncratic errors (Woodridge, 2002).

model, and the statistical significance of variable. Thus, using both model techniques and the above conditions we presented the results our empirical analysis in three tables. Table (7) reports the estimation results of the fixed effect model, and tables (8) & (9) report estimation results for the dynamic model of FDI using system Generalized Method of Moment (SYS-GMM) technique. On both model techniques we used the same set of variables except the latter ones include lagged dependent variable as regressor. In addition, in table (9) we have the same set of variable as table (8) but the two variables: financial development and regulatory quality variables are interacted; the motive behind this interaction of variables would be explained in the subsequent section.

4.3.1 Results of Static panel Analysis

Coming to the significance of the explanatory variable, we first present the fixed effect model and then result of dynamic model followed. In table (7) below of the fixed effect model, columns (2) and (3) show the results all components of the institutional variables: control of corruption, rule of law and regulatory quality; and the result of composite average of the three variables respectively.

In each column estimates of conventional variables are also reported. Starting the presentation with the main variables of our interest, the institutional quality variables, all have the predicted signs. In terms of significance, both control of corruption and rule of law are insignificant in our fixed effects model whereas regulatory quality (column, 2) and the institutional quality (column, 3) are significant at 5% and respectively, at 1% levels.

For the case of other explanatory variables, like institutional variables they have the expected sign. The results also show that almost most of them are significant. That is market size; infrastructure, financial development and exchange rate (in column, 2) are significant at 5% level whereas openness has 1% level of significance. Natural resource is not significant in our fixed model but it has positive sign.

Table -7: Estimation Results of Fixed Effect Model

Independent Variable	Dependent variable Ln_FDI in % GDP	
	(1)	(2)
Ln_GDP/Capita	0.3836235** (0.1957812)	0.3283339* (0.1924747)
Ln_Infrastructure	0.39565** (0.1920438)	0.4400235** (0.191175)
Ln_Natural Resource	0.060869 (0.0549004)	0.0540796 (0.0542573)
Macro/Policy Variables		
Ln_Openness	0.9627559*** (0.3613284)	0.924953** (0.3594047)
Ln_Financial Devt.	0.3555723** (0.1509573)	0.3541443** (0.1502286)
Lag Ln_Inflation	-0.0158406 (0.0498028)	-0.0236091 (0.0495846)
Ln_Real exchange Rate	0.0922799 (0.0583819)	0.1105693** (0.0589109)
Institutional Variables		
Ln_ Control of Corruption	0.0474169 (0.1193914)	-
Ln_Rule of law	0.03312 (0.0894584)	-
Regulatory quality	0.256574** (0.1129489)	-
Institution	-	0.6667575** (0.2560649)
Const	-8.209442*** (1.696673)	-7.714779*** (1.700136)
R-sq:(overall)	0.1150	0.1153
F-stat. (p value)	6.60 (0.0000)	8.44 (0.0000)
Number of obs	480	480
Number of countries	32	32

Notes: Std. Errs. are in parentheses and ***, ** and * denote significance at 1%, 5% and 10% levels respectively.

The other stylized variables: inflation and exchange rate (in column, 2),which represent the macroeconomic environment of the host country are insignificant but the latter one has 5% significance level in column (3) of our fixed effects table. Like other conventional variables exchange rate has not shown consistent level of significance on both columns of the table; this gives an idea that the effect of these variables do not seem much important to attract FDI to SSA

4.3.2 Results of Dynamic Panel Analysis

This section presents the results of our estimation using System General Method of Moment (SYS-GMM) of Arellano and Bover (1995) and Blundell and Bond (1998). A question can be raised in this section whether the impact of the explanatory variables on FDI differs under static and dynamic panel data analyses.

Table -8: SYS-GMM

Independent Variable	Dependent variable Ln_FDI in % GDP	
	(1)	(2)
Lag Ln FDI	0.3718766*** (0.0396892)	0.3564374*** (0.0400791)
Ln_GDP/Capita	0.4291484** (0.188181)	0.3927718** (0.1846729)
Ln_Infrastructure	0.2659878 (0.1927007)	0.2833326 (0.1897703)
Ln_Natural Resource	0.1338594** (0.0576093)	0.1321203** (0.0571379)
Macro/Policy Variables		
Ln_Openness	0.9391536*** (0.3318888)	0.9025485*** (0.3310646)
Ln_Financial Devt.	-0.4766727*** (0.1589624)	-0.4750544*** (0.1581992)
Lag Ln_Inflation	-0.0371698 (0.0499168)	-0.0468048 (0.0493768)
Ln_Real exchange Rate	-0.0294145 (0.0563615)	-0.01826 (0.0552401)
Institutional Variables		
Ln_ Control of Corruption	-0.0335201 (0.1309104)	-
Ln_Rule of law	0.1200563 (0.0987494)	-
Ln_ Regulatory quality	0.2898495** (0.1218989)	-
Institution	-	0.6566952*** (0.2354538)
Constant	-5.588463*** (1.443909)	-5.160547*** (1.468182)
Sargan test	0.1843	0.1834
Wald chi2 (p value)	207.11(0.0000)	208.91(0.0000)
Ar(1)	0.0027	0.0025
Ar(2)	0.2548	0.2303
Number of obs	480	480
Number of countries	32	32

Notes: Std. Errs. are in parentheses and ***, ** and * denote significance at 1%, 5% and 10% levels respectively.

Hence, we try to compare the results with the previous analysis, and finally make a summery for each variable based on the facts obtained from the results of the two analyses. Like the previous case, all components of the institutional quality and other explanatory variables are reported in column (2) and (3) respectively of the dynamic table (8) above.

Starting with institutional variables, like result of the static panel analysis, all have the expected sign except control of corruption, in terms of significance the control of corruption and rule of law are not again significant, while the regulatory quality (column,2) and institution quality (column, 3) are significant at 5% and 1% levels respectively.

Lagged FDI appears to be significant at 1% level in all of dynamic panel models; among the controlled variables: GDP per capita, natural resources availability and trade openness have their predicted sign and are significant in this model as well while the variables infrastructure, inflation and exchange rate have their expected sign but they are insignificant in our dynamic models. Surprisingly, the domestic credit to private sector which is the proxy measure of financial development has unlikely negative sign and significant at lower level in our dynamic model. This shows that over time increasing credit to private sector would reduce FDI flow to SSA countries. We now summarize the statistically significant results which were found to be robust; and the implication of insignificant results across different specifications of our models. We start with our hypothesis variable, institutional quality.

In all models the quality of institution is important determinant of FDI flow to SSA countries; however, the measures to reduce corruption and enforcement of rule of law could weaken its key potentiality to drive more FDI to the region. Which means that in all specifications, the results show that coefficient of control of corruption are sturdily insignificant which imply that the degree of corruption have not declined, this points out that there has been excessive bribery, patronage, and nepotism that have existed prevalently in SSA countries. In addition, the legal system and the extent to which the rule of law enforcement have not implemented well on past decades; there has been a sign of injustice in the court system that subsisted in the region on past decades. This weak enforcement of law and order could facilitate for prevalence of corruption and ineffectiveness of other governance indicators which were mentioned before. For instance,

the appearance of negative relation of control corruption with FDI in our dynamic model might be an indication of reducing corruption over time couldn't have importance for countries where weak enforcement on the rule of law has been persisted; which agrees with the hypothesis of Egger and Winner (2005) that in the presence weak enforcement rules and government bureaucracy, corruption serves as helping hand to foreign investors.

The significance of Lag of Foreign direct investment implies that there is a self-reinforcing effect of FDI on new FDI. Foreign investors invest their capital where countries which have a good records of FDI. This implies that the region's existing stock of foreign direct investment can attract fresh FDI to the region; this is the result of agglomeration effect on FDI flow. Thus, the positive relation and significance of this variable to attract new FDI flow show that the finding is consistent with our hypothesis and some studies, Matthieu et al. (2002) and Wheeler and Mody (1992) who confirmed that the importance of agglomeration on FDI flow.

Market size: the positive association and a significant market size (GDP per capita) is key determinant of FDI flow to the region, the coefficient of this variable significant at 5% level almost in all specifications results. This is also consistent with the theory that FDI is attracted more to a country where its real income or purchasing power is growing. These results are also consistent with the findings by Asiedu (2006), Hadjila (2010) and Ibrahim et al. (2011) who confirmed that large market size attracts more FDI to host country. This growing market size in the region leads to the conclusion that the horizontal FDI (i.e. a base to produce host country's domestic market) would be given more emphasis than the vertical integration.

Trade openness seems important determinant of FDI in these analyses, it is evident that open economy policy is more likely to implement and maintain stable macroeconomic policies than those of restrictive regimes. The coefficient of the variable in our result is highly significant almost in all of our specification results, and has positive relation with FDI. This is consistent with the theory that the more the host country access to international market the more foreign investors get accesses to invest their capital and purchase materials with appropriate price. This liberalization policy would also encourage to issue new and amend existing trade related policies

which pull MNC's towards the host country. This finding is also consistent with other studies that more liberalized economy would attract FDI (Aseidu, 2002; Cleeve, 2008, Anyanwu, 2011).

Natural recourses endowment: it is evident that the positive association and significance of natural resource availability (share of fuel and mineral to export) has a paramount importance to host countries to draw more FDI to their economy. The outcomes in our analyses show that the coefficient of the variable is not as significant as other stylized variables but it is still a crucial sector to attract foreign direct investment to this region. Its less momentous in our empirical results could have two reasons, first the most resources (fuel) endowed countries which bring difference in the outcome, like Equatorial Guinea, Chad, Angola and other states due to unavailability of complete data for all variables, and South Africa and Nigeria with their high resources endowment and the biggest recipients of FDI among SSA countries are not preferred to be part of our sample member. To ensure this facts we have regression result of fixed effects model for relatively resources endowed countries selected from our sample members and the result shows that the variable is significant to attract FDI for these states. On top of this, this variable has also 5% significance level in random effect model; this implies that country's specific effect can still have role for the importance of the variable to attract FDI flow to SSA (see for the results appendix-B, tables -5). On the other hand, the frail significance of this variable may be that natural resource by its nature is non-renewable and overtime it could be depleted; and countries can also diversify their economy into different sectors rather than sticking to this area, hence gradually the significance and positive association of this variable would be changed.

Financial development (domestic credit to private sector) is significant and has positive relation with FDI in our static model, but in table (8) of our dynamic model specification result shows that the variable has negative association with FDI and it is strongly significant at lower level. This could confirm that overtime increasing domestic credit would reduce foreign direct investment flows to the region, almost by -0.47 percent. This result is consistent with other studies, Anyanwu and Erhijakpor (2004) but it contradicts with the finding obtained by Ezeoha and Cattaneo (2011) who claimed that financial development is important driver of FDI to SSA. In addition, the negative coefficient, in one hand is significantly associated with the potential

substitution between domestic investment and volume of FDI in SSA; which means extra FDI is not required to SSA countries but there is still hunger of FDI. On the other side, the result also could support the argument that high level of credit to the private sector is an indication of the abundance of domestic capital and as such, foreign capital in the form of FDI would not be needed (Anyanwu, 2011).

Table -9: SYS-GMM with Interaction

Independent Variable	Dependent variable Ln_FDI in % GDP	
	(3)	(4)
Lag Ln FDI	0.3744506*** (0.0397214)	0.361106*** (0.0399651)
Ln_GDP/Capita	0.3878817** (0.1877127)	0.3831364** (0.1844963)
Ln_Infrastructure	0.2221993 (0.1927823)	0.1869472 (0.1912518)
Ln_Natural Resource	0.1339209** (0.0580778)	0.1381066** (0.0576417)
Macro/Policy Variables		
Ln_Openness	0.8294575** (0.3279466)	0.7380286** (0.3280737)
Ln_Financial Devt* Regulatory quality	0.1279163*** (0.0452313)	0.1050556** (0.0456404)
Lag Ln_Inflation	-0.0212819 (0.0494655)	-0.023547 (0.0488769)
Ln_Real exchange Rate	-0.0194787 (0.0562227)	-0.0059089 (0.0549)
Institutional Variables		
Ln_ Control of Corruption	-0.0429583 (0.1301586)	-
Ln_Rule of law	0.1169421 (0.0987939)	-
Institution		0.5233458** (0.2396963)
Constant	-6.065215*** (1.430722)	-5.45381*** (1.460064)
Sargan test	0.1280	0.1236
Wald chi2, (p value)	200.16 (0.0000)	205.48 (0.0000)
Ar(1)	0.0027	0.0028
Ar(2)	0.2566	0.2521
Number of obs	480	480
Number of countries	32	32

Notes: Std. Errs. are in parentheses and ***, ** and * denote significance at 1%, 5% and 10% levels respectively.

Despite all such points of view, in our literature part we asserted that the existence of sound financial system and regulatory quality are very essential for FDI flow and in such a way that the former can perform better as it is conjugated with the latter. In this regard we amalgamated the financial development with the regulatory quality variables and the result is shown in table (9) above and it shows that sign of coefficient has become positive and significant. This leads to a conclusion that financial development could be feasible only if it is supported by quality of regulatory policy. The result is also consistent with findings obtained by Ibrahim et al. (2011).

Infrastructure variable: (measured as number of telephone line per 1000 inhabitants) is not significant in our dynamic model specification, but it has positive association with FDI, which is consistent with our hypothesis. The insignificance of the variable implies that in one hand the existing poor infrastructural condition of the region is not too attractive or incapable of catching the attention of MNC's to this region as compared to other significant variables, or its robustness in dynamic panel analysis is overweighed by other variables.

Macroeconomic condition: negative association of inflation with FDI in all of our model specifications confirms the existence of price instability in the region; similarly insignificance of exchange rate variable in our dynamic model and its negative association with FDI imply the existence of macroeconomic mismanagement in the region. In other word, the relentless host-country's currency depreciation reduces the amount of foreign exchange that foreign investors can repatriate as profit, dividends, royalties and so on. Inflation-induced depreciation could have also the effect of reducing the net capital of the foreign investors. Hence, such conditions can lose confidence of the domestic foreign investors and would have a negative consequence in the future FDI flows to the region. These results are also consistent with findings of other authors like Onyeiwu and Sherestha (2004), Asiedu(2006) and Hadjila (2010).

4.4 Tests of Serial correlation and Over-identification Condition

The moment conditions used by SYS-GMMs are valid only if there is no serial correlation in the idiosyncratic errors. The values of the Arellano–Bond test for serial correlation reported at the bottom of SYS-GMM estimation results for both first and second order: Ar (1) and Ar (2) tests. The first order autocorrelation test report rejects the null hypothesis of no autocorrelation. Since

the first difference of independently and identically distributed idiosyncratic errors would be autocorrelated, and rejecting the null hypothesis of no serial correlation at order one in the first-differenced errors does not imply that our models are misspecified. Thus, autocorrelation of first order Ar (1) is always misleading and not predictable.

As suggested by Roodman(2007), relying on the first test result of autocorrelation is not able to be trusted and checking the second order serial correlation is recommended to test the presence of autocorrelation. Rejecting the null hypothesis at higher (second) orders implies that the moment conditions are not valid. However, the test result of the second order autocorrelation Ar (2) result shows that it fails to reject the null hypothesis, which attests that there is no autocorrelation. Hence, the Arellano–Bond test result for serial correlation for the second order reported for all sys-GMM models is implying that our dynamic models have no problem of serial correlations, and presents no evidence that model is misspecified.

Like all dynamic model estimators, the estimator in sys-GMM can produce consistent estimates only if the moment conditions used are valid. Although there is no method to test if the moment conditions from an exactly identified model are valid, one can test whether the over identifying moment conditions are valid. Sargan implements the Sargan test of over- identifying conditions as discussed in Arellano and Bond (1991). The null of this test is that over identifying restrictions are valid. According to Roodman(2006), higher probability greater than 0.25 is depicted as doubt of the problem many instruments where as the probability of less than 0.1 also suggests an indication using too small instruments that could weaken the probability, which is unacceptable as suggested by the author. Intuitively the instrumental reckoning that may generate p-value in between 0.1 and 0.25 may be seen as reducing the problem of excessive instruments. As it can be seen from the test results of SYS-GMM estimation, the null hypothesis of valid specification is not rejected and implying that the set of instruments used in the models are valid and our models are well specified.

Chapter Five

Conclusion and Policy Implication

After Institutional Economics was pioneered, economists debate on the importance of institutional quality to be as one of crucial factor for well performance of the economy across counties. Since last two decades there has been a consensus by many authors that this variable is also one of the major underpinning factors in attracting foreign direct investment to the host countries. In line with this argument, this thesis project investigates the magnitude, the dynamic and keystone factors of foreign direct investment flow to SSA countries. It was described that the flow of FDI to the region has some progress but it has shown abysmal flow comparing to other regions of the world, and also it has had uneven distribution among SSA countries for the decades. In fact, there are several factors that drive the flow of FDI to a country, but we have tried to investigate the main determining aspects which are based on the milieu of the SSA. Among the main underpinning factors: institutional quality like rule of law, control of corruption and regulatory quality, in case of the traditional variables: market potential, infrastructural condition, natural resources availability, macroeconomic environment, trade openness and finance development have been explored their effects on FDI flows to the region.

Before we go to estimation, different diagnostic tests have been examined. Among these, tests of multicollinearity, unit root tests, panel co-integration tests have been conducted. As a result, we verified that there is no problem of multicolinearity. For the case of unit root tests, some variables are found to be stationary at level whereas others were non-stationary, and transformed into stationary after first differencing. Having non stationary series, we made a test of co-integration between foreign direct investment and institutional quality. The result shows that it fails to accept the null hypothesis of no co-integration between the two variables. Thus, the Peedroni statistic supports the existence of long run relationship between foreign direct investment and institutional variable. We employed wald causality test to investigate the direction of causality between these two variables and the result shows that there is a bidirectional relation between the two variables, in which the causality is running from institutional quality to FDI and vice versa. Following these tests, the static and dynamic panel

analyses have been conducted using fixed effects and sys-GMM techniques respectively for estimation of the model.

Corresponding to these empirical analyses, we started to examine on our main interpretative hypothesis variable, the institutional quality. In all models the average of quality of institution variables is important determinant of FDI flow to SSA; however the measures to reduce corruption and enforcement of rule of law are mediocre and not enough to drive more FDI to the region. On the other side having existed stock of foreign direct investments is also important determinant of FDI, it is helpful for foreign investors to invest their capital confidently in host country.

With regard to other explanatory variables: market size, openness, financial development (domestic credit to private sector), natural resource availability (share of fuel and mineral to export) are important determinant factors to increase FDI flow to this region. In contrast, infrastructure is not significant to attract FDI flow to the region but it has positive association with FDI. Similarly, the negative association of inflation with FDI and insignificance of exchange rate imply that the macroeconomic environment falls short in attracting FDI flow to the region.

In general, the results that we obtained from our empirical analysis have major policy implications in which countries of the region need to give emphasis. The main lesson that we get from this result is that FDI in SSA is not exclusively driven by some external or conventional factors only; even countries which are deficient in natural resources can obtain FDI by improving their institution and by taking policy actions. So, in order to bring in the benefit that accrue from FDI, in the first hand Sub-Saharan Africa countries should strive to improve their institutional quality in advance, policies of such issues might be formulated but should not be taken as a craze, leaders and economic managers of the region must have commitment to take more action to curb corruption, and establish transparent and dependable legal system to enforce rule of law. Having sound and strong legal system is believed to be a paving ground for the effectiveness of all kinds of governance indicators, it builds confidence on foreign and domestic investors and facilitate the overall performance of economic growth and then possible to reap more FDI flow

to the region. A very simple reality, countries that have insufficient natural resource endowment but have improved institutional quality (according to WB/WDI 2001 report), have better records of FDI flow and showing a good economic progress among SSA countries on the past decade. Thus, having a good quality institution is an effectual tool that SSA countries should take up to improve their global positioning in FDI flow so that they can ameliorate the perennial investment capital shortages that characterize the region.

Another policy implication that should be given attention is that the existing macroeconomic environment difficulty which has resulted from macroeconomic-mismanagement. Given the small economy and the importunate unemployment problem, most countries of the region might probably interest to focus on economic growth rather than curbing inflationary problem which has been also aggravated by persistent depression of their domestic currency. It is apparent that economic growth can help to generate employment opportunities, and also sometimes perhaps used as an endorsement for the stability of the government; however, the persistency of such macroeconomic-instability in the region, which would be aggravated by the current global condition, could destabilize their fragile economy and can create further adversity in social and economic condition of the region, and it might not generate huge FDI to the region. Because reports show that in some SSA countries the existing inflationary problem and exchange rate volatility since the few years' time (according to WB/WDI 2011 report) are quite disturbing, and it is bigger than any region of the world. Thus, unless both conditions are addressed cautiously more FDI flow specifically market seeking FDI flow will be reducing in the future.

Finally, to be competitive in the global investment inflow, in addition to the above strategic actions, SSA countries should make every effort to promote open market economy by lifting every restrictions, increase their domestic market size, develop telecommunication infrastructure, roads and other related activities which are very fundamental for overall development of the region and also help to draw the attention of MNC's to invest their capital in the region.

Reference:

Abbi K., Abdalla H., Adam E., and Gamal I. (2011). "Revisiting the Determinants of Foreign Direct Investment in Africa: the role of Institutions and Policy Reforms," *Working Paper.*

Abel E. Ezeoha and Nikki Cattaneo (2011). "FDI Flows to Sub-Saharan Africa: the Impact of Finance, Institution and Natural Resource Endowment"

Addison, T. and Heshmati, A. (2003). "The new global determinants of FDI flow to developing countries: the importance of ICT and democratization." *WIDER.*

AfDB, UNDP, UNECA and African Economic Outlook (2011). "Africa and its emerging partners," *African Development Bank.*

Ahnsy et al (1998). "The effects of inflation and exchange rate policies and direct investment to developing countries," *Inter Eco J 12(1): 95-104.*

Ahmad J., Maryam M., Reza M. Khosro A. (2011). "Political Stability and FDI in OIC Countries," *Journal of Social and Development Sciences*, Vol. 1, No. 1, pp. 18-23.

Alan A. Bevan and Saul E.(2004). "The determinants of foreign direct investment into European transition economies," *Journal of Comparative Economics*, 32 (2004) 775–787.

Arellano, M. and Bond S. (1991). "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," *Review of Economic Studies*, 58,277–294.

Arellano, M. and Bover O. (1995). "Another Look at the Instrumental Variable Estimation of Error-Components Models," *Journal of Econometrics*, 68, 29–51.

Asiedu and Freeman (2009). "The Effect of Corruption on Investment Growth: Evidence from Firms in Latin America, Sub-Saharan Africa, and Transition Countries."

Asiedu, E. and A. Villamil (2003). "Promoting Efficient Institutions and Providing Insurance Services: A Dual Role for Multilateral Organizations," *University of Kansas Working Paper*

_____ (2002). "On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different?" *World Development*, Vol. 30 No. 1, pp. 107–119.

_____ 2003. "Foreign direct investment to Africa: The role of government policy, governance and political instability," *working paper.*

_____ (2000, 2006). "Foreign direct investment in Africa: The role of Natural Resources, Market size, Government policy, Institutions and Political instability," *The World Economy*, 29 (1): 63-77

Ashford C. Chea (2011). "Global Private Capital Flows and Development Finance in Sub-Saharan Africa: Exemplary Performers, Lessons for Others, and Strategies for Global Competitiveness in the Twenty-First Century."

Baltagi, B., P. Demetriades, and S. H. Law (2009). "Financial Development and Openness: Evidence From Panel Data," *Journal of development economics* 89(2):285-296.

Benassy, A., Larche-Revil A. and Fontagne L. (2000). "MENA countries in the competition for FDI: Designing an exchange rate strategy ", *International Seminar GDR-EMMA, Commissariat du plan*, Paris.

Ben-Taher and Giorgioni Gianluig (2007). "The Determinant of Foreign Direct Investment .A panel data study on AMU countries," *Liverpool Business School, Liverpool John Moores University.*

Berhanu Nega (1999). "Foreign Direct Investment in Ethiopia. in Alemayehu Geda(ed.)," *Economic Focus* Vol. 2, no.3.

_____(1998). "Domestic Industry and International Competition (in local language), in Alemayehu Geda(ed.)," *Economic Focus* Vol. 1, no.3

Beirhanu Nega and Kibre Moges (2003). "International Competitiveness and the Business Climate in Ethiopia," *Ethiopian Economic Association, Working Paper* No.1/2003

Bevan A., Estrin S. and Meyer K. (2004). "Foreign investment location and institutional development in transition economies," *International Business Review.*

Blonigen B. (2005). "Review of the Empirical Literature on FDI Determinants," *Atlantic Economic Journal.*

Blundell, R. and Bond, S. (1998). "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models," *Journal of Econometrics*, 87, 115–143.

Bond, S.(2002). "Dynamic Panel Data Models. A Guide to Micro Data Methods and Practice," *Working paper* Vol.09, No.02, Institute for Fiscal, studies, London.

Bond, S., A. Hoeffler and J. Temple (2001), "GMM Estimation of Empirical Growth Models," *Oxford University.*

Busse, M. and Hefeker, C. (2007). "Political Risk, Institutions and Foreign Direct Investment," *European Journal of Political Economy.*

Caves, R.E.(1996). "Multinational Enterprise and Economic Analysis," 3rd Ed, *Cambridge: Cambridge University Press.*

Chantal Dupasquier and Patrick N. Osakwe (2005). "Foreign Direct Investment in Africa: Performance, Challenges and Responsibilities."

Chakarabarti A. (2001). "The Determinants of Foreign Direct Investment: Sensitivity Analyses of Cross-Country Regressions," *KYKLOS* 54: 89–112

Chen, K.; Rau, H.; Lin, C. (2006). "The Impact of Exchange Rate Movements on Foreign Direct Investment: Market-Oriented Versus Cost-Oriented", *the Developing Economies*, Vol. 44, Num. 3, pp. 269-287.

Calderon, C. and Liu, L. (2003). "The Direction of Causality between Financial Development and Economic Growth," *Journal of Development Economics*, Vol. 72 No. 1, pp. 321–334.61

Cleeve, E. (2008). "How effective are fiscal incentives to attract FDI to Sub-Saharan Africa?" *The Journal of Developing Areas*, 42 (1): 135-153.

Dani Rodrik (2004). "Getting Institutions Right Cesifo Dice Report."

Daniele, Vittorio and Marani (2006)." Do institutions matter for FDI? A comparative analysis for the MENA countries."

De Melo, M., C. Denizer, A. Gelb and S. Tenev (1997). "Circumstance and choice: The role of initial conditions policies in transition economies," *Policy Research Working Paper* No. 1866, the World Bank, Washington, D.C.

Di Mauro, F.(2000). "The Impact of Economic Integration on FDI and Exports: A Gravity Approach," *Working document* No. 156, Center for European Studies.

Din M (1994). "Export processing zones and backward linkages," *J Dev Eco* 43(2): 369-385

Dunning John H (1980, 1988, and 1993). "Multinational Enterprises and the Global Economy" *Wokingham, U.K*: Addison Wesley publishing company.

Dunning, J.H.; Lundan, S.M (2008). "Theories of foreign direct investment," *in John H. Dunning Sarianna M. Lundan (orgs.), Multinational Enterprises and the Global Economy*, Cheltenham: Edward Elgar Publishing Limited, pp 79-115.

Egger, P. and Winner, H. (2005), "Evidence on Corruption as an Incentive for Foreign Direct Investment," *European Journal of Political Economy*, Vol. 21, No. 1, pp.932-952.

Economic Commission for Africa (2005). "Foreign Direct Investment in Africa: Performance, Challenges and Responsibilities."

Faeth, I. (2009). "Determinants of foreign direct investment – a tale of nine theoretical models," *Journal of Economic Surveys*, 23 (1): 165-196.

Gastanaga, Victor, Nugent, Jeffrey N. and Pashamove, Bistra (1998). " Host country Reforms and FDI Inflow: How much Difference O They make ?" *World Development* 26(7): 1299-1314 campus.

Globerman, S. and Shapiro, D. (2003). "Governance Infrastructure and U.S. Foreign Direct Investment," *Journal of International Business Studies,* 34(1), 19-39.

Giuliano, P. and Ruiz-Arranz. M. (2009). "Remittances, Financial Development, and Growth," *Journal of Development Economics*, Vol. 90, No. 1, pp. 144-152

Granger, C.W.J.(1969). "Investigating Causal Relation by Econometric Model Cross-Special method," *Econometrica*, 37, 3, 427-438

Greene, W. H. (2003). "Econometric Analysis", 5th edition, New York University.

Gujarati D. N. (2004). "Basic Econometrics", 4th Edition, McGraw–Hill Companies.

Hermes N, and Lensink R (2003). "Foreign Direct Investment, Financial Development and Economic Growth," *Journal of Development Studies*, Vol. 40 No. 1, pp. 142–163.

Hadjila (2010). "Business Climate, Political Risk and FDI in Developing Countries: Evidence from Panel Data." *International Journal of Economics and Finance*, Vol. 2, No.

Harrison, Andrew L., Dalkiran, Ertugrul and Elsey, Ena (2000). "International Business: Global Competition from a European Perspective," Oxford University Press.

Hyun HJ (2006). "Quality of Institutions and Foreign Direct Investment in Developing Countries: Causality Tests for Cross-Country Panels," *working paper*, Korea Institute for International Economic Policy.

International Monetary Fund (1993). "Balance of Payment Manual," 5th edition.

Im,.K.S., Pesaran M.H. and Shin, Y, (2003). "Testing for Unit Heterogeneous panel," *Journal of Econometrics*, No115.

International Monetary Fund (2003). "World Economic Outlook," Washington D.C.: IMF.

Islam, N. (1995). "Growth empirics: A panel data approach," *The quarterly Journal of Economics*, No.4,pp.1127-1170.

Jameel Khadarooa, Boopen Seetanahb (2004). "Transport Infrastructure and FDI: Lessons from Sub Saharan African Economies," University of Technologie, Mauritius, Pointes aux Sables.

Jana Parletun (2008). " The Determinants of Foreign Direct Investment: A Regional Analysis with Focus on Belarus."

Jenkins, Carolyn and Thomas, Lynne (2002). "Foreign Direct Investment in Southern African: Determinants, Characteristics and Implications for Economic Growth and Poverty Alleviation."

Johansen, S. (1988). "Statistical analysis of cointegration vectors," *Journal of Econometrics Dynamic*, No. 12 pp. 231-54.

John C. Anyanwu (2011). "Determinants of Foreign Direct Investment Inflows to Africa 1980-2007," *African Development Bank Group, Working Paper.*

Khondoker Abdul Mottaleb (2007). "Determinants of Foreign Direct Investment and Its Impact on Economic Growth in Developing Countries," *working paper.*

Kwadwo Ofori-Brobbey and Lucy Ojode (2009). "The Effect of Governance Quality on Foreign Direct Investment Flows into Sub-Saharan Africa Assistant," *The Journal of International Management Studies,* Volume 4, Number 222.

Kamaly, A. (2004). "Evaluation of FDI flow into MENA region," *Economic Research Forum working paper series*, Cairo, Egypt.

Kaufman D. A. Kraay (2005). "Governance and Growth, Causality which way?" *Evidence from the World, in brief", mimeo*, World Bank.

Lipsey, R. E. (1999). "The location characteristics of US affiliates in Asia," *NBER Working Paper* No. 6876.

Lucas, R. (1993). "On the Determinants of Direct Foreign Investment: Evidence from East and Southeast Asia", *World Development*, Vol. 21 (3): 391-406.

Linda, M. Matar and Said M. Elfakhani (2007). "Foreign direct investment in the Middle East and North Africa region," *Journal of Global Business Advancement*, Vol. 1, No. 1.

Matthias Busse and Carsten Hefeker (2005), "Political Risk, Institutions and Foreign Direct Investment," *HWWA discussion paper* No 315.

Maitena Duce and Banco de España (2003). "Definitions of Foreign Direct Investment (FDI), a methodological note."

Mauro, Paulo (1995). "Corruption and Growth, Quarterly Journal of Economics."

Moss, T., Ramachandran, V., and Shah, M. (2004). "Is Africa's skepticism of foreign capital justified?" Evidence from East African firm survey data, *Center for Global Development, Working Paper.*

Markusen, J.R. (1995). "The Boundaries of Multinational Enterprises and the Theory of International Trade," *Journal of Economic Perspectives*, No 9 (2).

Mike Pournarakis and Nikos C. Varsakelis (2004), "Institutions, internationalization and FDI: the case of economies in transition," *Transnational Corporations*, Vol. 13, No. 2.

Mohamed, S.E; Sidiropoulos, M.G. (2010). "Another look at the determinants of foreign direct investment in MENA countries: an empirical investigation," *Journal of Economic Development*, 35 (2): 75-95.

Mhlanga, N.; Blalock, G., Christy, R. (2010). "Understanding foreign direct investment in the southern African development community: an analysis based on project-level data," *Agricultural Economics,* 41 (3-4): 337-347.

Matthieu Crozeta, Thierry Mayerb and Jean-Louis Mucchiellia (2002). "How do firms agglomerate? A study of FDI in France," University of Paris I and CNRS, 106– *112 Bd de l'hopital,* 75647 Paris Cedex 13, France.

Mike Pournarakis and Nikos C. Varsakelis (2004). "Institutions, internationalization and FDI: the case of economies in transition," *Transnational Corporations*, Vol. 13, No. 2.

Morisset, Jacques (2000). "Foreign Direct Investment in Africa: Policies also matter," *Transnational Corporation*, 9(2), 107-125.

Nauro F. Campos and Yuko Kinoshita (2006). " Why Does FDI Go Where it Goes? New Evidence from the Transition Economies," *Africa Research Group.*

Nikolaos Antonakakisy Gabriele Tondlz (2010). " Do determinants of FDI to developing countries differ among OECD countries? Insights from a Bayesian Panel Data Approach."

North NC (1990). "Institutions, institutional change, and economic performance," Cambridge University Press.

OECD (2002). "Foreign Direct Investment for Development: Maximizing benefits and minimizing cost," Paris: OECD publishing service.

Pedroni, P. (1999a), "Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors," *Oxford Bulletin of Economics and Statistics*, Special Issue. (1999)

_____(2004) " panel Cointegration: Asymptotic and Finite Sample properties of pooled Time series Tests," *Econometric Theory* , No 20 pp.597-627

Quere, Coupet and Mayer (2005). "Institutional Determinants of Foreign Direct Investment."

Rogoff, K. and Reinhart, C. (2003). " FDI to Africa: the role of price stability and currency instability," *Working Paper*, International Monetary Fund.

Roodman, D. (2006). "How to do Xtabond2: An Introduction to "Difference" and "system" GMM in Stata," *Working paper 103.*

_____(2007). "A short Note on the Theme of Too Many Instruments," *Working Paper 125.*

Sachs, J. and Sievers, S. (1998). "FDI in Africa," *Africa Competitiveness Report 1998*, Geneva: World Economic Forum.

Sahoo P. (2006). "Foreign Direct Investment in South Asia: Policy, Trends, Impact and Determinants," *Discussion paper No. 56*, ADB Institute.

Steve Onyeiwu and Hemanta Shrestha (2004). "Determinants of Foreign Direct Investment in Africa," *Journal of Developing Societies* 2004 20: 89.

Susana Assunçao, Aurora A. C. Teixeira and Rosa Forte (2011). "Do Countries' Endowments of Non-renewable Energy Resources Matter for FDI Attraction? A Cross-country FEP Econometric Analysis," *Working Paper Research*, Porto University.

Singh, H. and Jung, K.W (1995). "Some new evidence on Determinants on Foreign Direct Investment in Developing Countries," *Policy Research Working Paper* 1531, the World Bank.

Schneider, F., and Frey B. (1985). "Economic and Political Determinants of Foreign Direct Investment." World Development. 13 (2): 161-175.

T. Ademola Oyejide (1999). "Taking Stock of Sustainable Development Finance in Sub-Saharan Africa."

Thomas A. Pugel and Peter H. Lindert (2000). "International Economics," 11th edition, USA: McGraw- Hill Companies,Inc.

Todaro, Michael P. (1992). "Economics for developing world," 3rd edition, New Delhi: Longman Limited.

UN Conference Centre (UNCC) (2011). " Review of the Progress since the Doha Follow-up International Conference on Financing for Development," Addis Ababa, Ethiopia

UNCTAD (2010), FDI/INC database (http://www unictad.org//fdistatstics.

UNCTAD(1998, 1997, 1996, 1995 1999. 2000, 2008). "Foreign Direct investment in Africa: performance and Potential," New York and Geneva: United Nations.

Venables, Anthony J. (1999). "Foreign direct investment as a catalyst for industrial development, European Economic Review," Elsevier, vol. 43(2). Pages 335-356.

Verbeek M. (2004). "A Guide to Modern Econometrics," 3rd Edition, Erasmus University Rotterdam.

Vernon,R. (1966). "International Investment and International Trade in the product cycle, *Quarterly Journal of Economics*, No.80.

Wei, S J.(2000). "How Taxing Is Corruption to International Investors?" *The Review of Economics and Statistics*.

Wheeler, D. and A. Mody (1992). " International investment location decisions: The case of U.S. firms," *Journal of International Economics*, 33, 57-76. World Bank (2011) Africa Development Indicator report.

Xing, Y.; Wan, G. (2006). "Exchange Rates and Competition for FDI in Asia," *World Economy*, Num. 29, pp. 419-434.

Yartey, C. A. and Adjasi, C. K. (2007). "Stock Market Development in Sub-Saharan Africa: Critical Issues and Challenges," *IMF Working Paper* No. WP/07/209.

Zenegnaw Abiy Hailu (2010). "The demand side factors importance for FDI inflows in African countries," *Shanghai University of Finance and Economics* Vol. 5, No. 5.

Appendix – A: List of Sample countries For Empirical Analysis

	Country
1	Benin
2	Botswana
3	Burkina Faso
4	Burundi
5	Cameroon
6	Cape Verde
7	Central African Republic
8	Côte d'Ivoire
9	Ethiopia
10	Gabon
11	Gambia
12	Ghana
13	Guinea
14	Kenya
15	Lesotho
16	Madagascar
17	Malawi
18	Mali
19	Mauritania
20	Mauritius
21	Mozambique
22	Niger
23	Rwanda
24	Senegal
25	Seychelles
26	Sudan
27	Swaziland
28	Togo
29	Uganda
30	Tanzania
31	Zambia
32	Zimbabwe

Source: World Bank

Appendix – B: List of Tables

Table -1: FDI flow to SSA in comparison to the world and selected regions from 1990-2010

Regions	1980-1990			1991-2000			2001-2010		
	Annual average FDI inflow (in millions dollars)	As share of the world inflow	FDI stock as percentage of GDP	Annual average FDI inflow (in millions dollars)	As share of the world inflow	FDI stock as percentage of GDP	Annual average FDI inflow (in millions dollars)	As share of the world inflow	FDI stock as percentage of GDP
World	1167599	1	7.9	4168596	1	14.23	13108279	1	26.8
Developed economies	778632	0.67	6.53	3138583	0.75	13.76	9383867	0.72	27
Developed economies: America	341359	0.29	7	1589067	0.38	17.9	3220236	0.25	22.9
Developed economies: Asia	10027	0.01	0.6	36906	0.01	0.8	173398	0.01	3.6
Developed economies: Europe	382728	0.33	8.1	1383244	0.33	15.3	5645698	0.43	37.6
Developed economies :Oceania	44518	0.04	16.1	129367	0.03	29.2	344535	0.03	37.8
Developing economies	388519	0.33	13.54	1009038	0.24	17.11	3359507	0.26	26.47
Developing economies excluding China	380550	0.33	15.08	895367	0.21	17.8	3037986	0.23	31.15
Developing economies: America	72663	0.06	8.7	262779	0.06	14.2	994203	0.08	30.9
Developing economies : Asia	267909	0.23	16.7	644157	0.15	18.5	2041786	0.16	24.4
Developing economies :Oceania	1385	0	16.7	2997	0	16.9	5997	0	20.6
Transition economies	448	0	0.24	20975	0.01	4.84	364905	0.03	26.53
Least developed countries	8291	0.01	6.7	22530	0.01	13.8	85946	0.01	24.7
Developing economies: Africa	46562	0.04	11.1	99105	0.02	18.13	317521	0.02	29.16
Eastern Africa	3902	0	7.06	8293	0	13.05	28736	0	25.11
Middle Africa	3790	0	11.69	8054	0	22.91	33658	0	42.87
Northern Africa	15782	0.01	10.29	34633	0.01	15.84	116598	0.01	26.43
Southern Africa	14556	0.01	17.2	23561	0.01	16.09	82277	0.01	31.28
Western Africa	8534	0.01	10.13	24565	0.01	32.02	56252	0	29.74
Africa excluding South Africa	35202	0.03	10.43	79102	0.02	19.42	240773	0.02	28.4
Northern Africa excluding Sudan	15714	0.01	11.08	34237	0.01	16.48	106336	0.01	26.77
Sub-Saharan Africa	30849	0.03	11.07	64868	0.02	19.35	211185	0.02	30.59
Sub-Saharan Africa xcluding South Africa	19488	0.02	10.02	44864	0.01	22.68	134437	0.01	30.03

Note: Computed from data obtained UNCTAD, FDI/INC database (http://www unictad.org//fdistatstics

Table-2: Change of FDI flow to SSA in Comparison with other Regions (1990-2010)

YEAR	1990-1995	1996-2000	2000-2005	2005-2010
World	91.7	114.4	67.5	78.8
Developing economies	58.5	98.8	59.6	118.1
Developed economies	106.1	118.3	67.5	63.4
Developing economies: Africa	50.8	67.3	67.3	110.0
Eastern Africa	38.7	89.7	78.9	98.4
Middle Africa	29.4	65.0	141.9	81.7
Northern Africa	55.1	42.7	65.0	151.4
Southern Africa	22.9	111.7	72.9	99.9
Western Africa	94.0	62.7	35.5	77.8
Developing economies: America	81.7	138.8	81.4	100.6
Caribbean	25.3	422.2	154.1	172.8
Central America	111.6	99.0	153.2	65.5
South America	78.0	132.5	44.1	99.3
Developing economies: Asia	52.7	90.6	49.2	128.7
Eastern Asia	35.3	81.3	47.5	100.1
Southern Asia	62.0	177.5	104.1	239.6
South-Eastern Asia	176.2	125.7	36.1	125.4
Western Asia	24.4	45.5	94.1	291.0
Developing economies: Oceania	93.7	8.3	6.8	166.6
Developed economies: America	98.0	168.1	22.2	30.7
Developed economies: Asia	90.1	118.9	123.2	113.7
Developed economies: Europe	114.4	82.9	125.1	83.7
Developed economies: Oceania	105.3	40.6	62.4	84.6
Developing economies excluding China	49.7	88.8	62.6	123.4
Developing economies excluding LDCs	58.3	98.8	58.8	118.7
Least developed countries	66.9	97.5	95.9	98.5
Sub-Saharan Africa	**48.1**	**83.9**	**72.2**	**95.7**
Sub-Saharan Africa excluding South Africa	56.3	62.5	68.9	90.6

Source: computed from data obtained UNCTAD, FDI/INC database (http://www unictad.org//fdistatstics

Table-3: Share of FDI flow to Individual Countries of SSA over Different Period

Country	Year			
	1990-194	1995-1999	2000-2004	2005-2010
Angola	4.4	5.9	8.9	5.6
Benin	0.0	0.1	0.2	0.2
Botswana	2.8	1.7	1.0	0.4
Burkina Faso	0.1	0.1	0.0	0.2
Burundi	0.1	0.0	0.0	0.0
Cameroon	2.4	1.8	1.7	1.5
Cape Verde	0.0	0.1	0.2	0.3
Central African Republic	0.2	0.1	0.1	0.1
Chad	0.6	0.6	1.5	1.2
Comoros	0.0	0.0	0.0	0.0
Congo	1.7	1.7	1.8	3.8
Côte d'Ivoire	2.6	2.6	2.4	2.1
Dem. Rep. of the Congo	1.3	0.8	0.6	0.8
Djibouti	0.0	0.0	0.0	0.2
Equatorial Guinea	0.2	0.8	1.8	2.1
Eritrea	0.0	0.2	0.3	0.1
Ethiopia	0.2	0.7	1.3	1.4
Gabon	2.7	0.3	0.0	0.4
Gambia	0.4	0.3	0.2	0.2
Ghana	1.0	1.5	1.4	1.8
Guinea	0.3	0.2	0.3	0.5
Guinea-Bissau	0.0	0.0	0.1	0.1
Kenya	1.6	1.1	0.8	0.7
Lesotho	0.3	0.3	0.3	0.3
Liberia	6.3	3.9	2.7	1.6
Madagascar	0.3	0.3	0.2	0.9
Malawi	0.5	0.4	0.3	0.5
Mali	0.5	0.5	0.4	0.4
Mauritania	0.2	0.1	0.3	0.7
Mauritius	0.5	0.5	0.6	0.6
Mayotte	0.0	0.0	0.0	0.0
Mozambique	0.2	0.9	1.4	1.4
Namibia	4.4	2.1	1.7	1.3
Niger	0.7	0.4	0.1	0.3
Nigeria	26.4	27.3	21.3	16.1
Rwanda	0.1	0.1	0.0	0.1
Saint Helena	0.0	0.0	0.0	0.0
Sao Tome and Principe	0.0	0.0	0.0	0.0
Senegal	0.6	0.6	0.2	0.4
Seychelles	0.6	0.6	0.5	0.5
Sierra Leone	0.6	0.3	0.2	0.2
Somalia	0.0	0.0	0.0	0.1
South Africa	24.8	31.1	33.7	37.6
Sudan	0.2	0.6	2.4	5.6
Swaziland	1.0	0.7	0.5	0.3
Togo	0.6	0.5	0.4	0.3
Uganda	0.1	0.6	0.9	1.5
Tanzania	1.0	1.6	2.8	2.4
Zambia	6.6	4.9	3.5	2.6
Zimbabwe	0.7	1.2	1.0	0.6
Sub-Saharan Africa n.e.s.	100.0	100.0	100.0	100.0

Source: Computed from data obtained UNCTAD, FDI/INC database (http://www unictad.org//fdistatstics

Table-4 Summary of determinant variables proxy measure source and expected sign

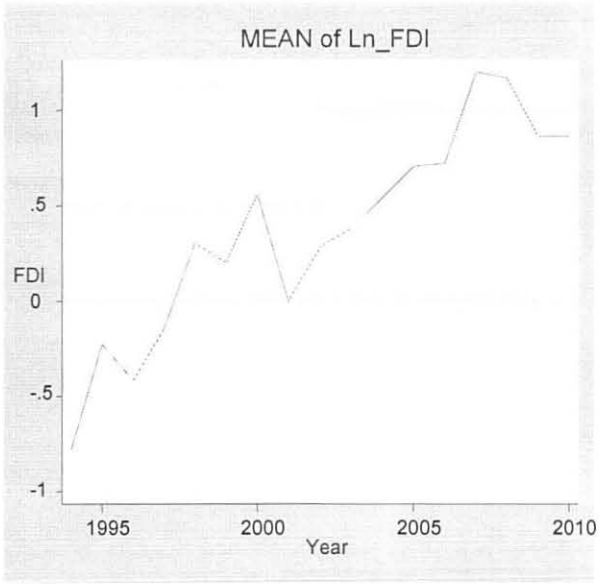
Determinants	Proxy measure	Source	Expected effect on FDI
Dependent Variable FDI	FDI/GDP	WB/WDI	
Independent Variables			
Quality of Institution variables			
Rule law	Rule law index	World Bank/WGI	Positive
Control of Corruption	Control of Corruption index	World Bank/ WGI	Negative
Regulatory quality	Regulatory quality index	World Bank/ WGI	Positive
Conventional variables			
Market size	Per capita GDP	World Bank /WDI	positive
Infrastructure	No phone lines per 1000 inhabitants	World bank / WDI	positive
Resource endowment	Share of fuel and mineral over total export (FUL+MIN)/EXPO	World bank / WDI	positive
Agglomeration	Lag FDI	World bank / WDI	positive
Macroeconomic /policy variables			
Inflation	Annual average change of consumer price index	WB/WDI	Negative
Exchange rate	Domestic currency against USD	WB/WDI	ambiguous
Openness	(X+M)/GDP	WB/WDI and UNCTAD	positive
Financial development	Domestic credit to gross domestic product (DC/GDP)	World bank / GDF	Positive

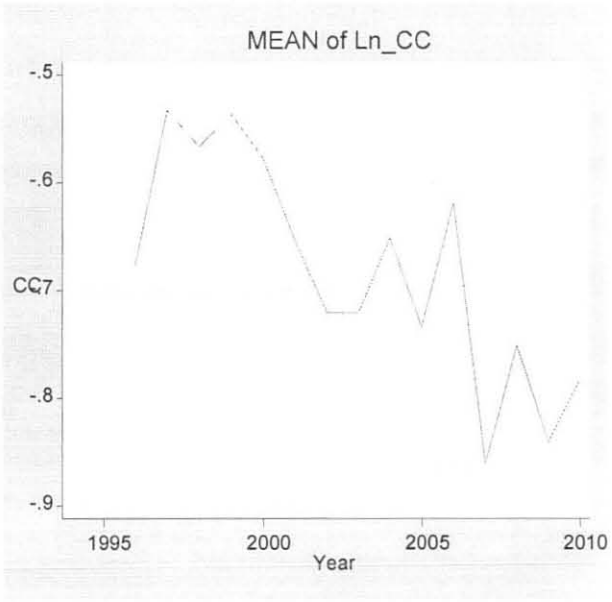
Table-5: Results of Fixed effects versus Random effects model

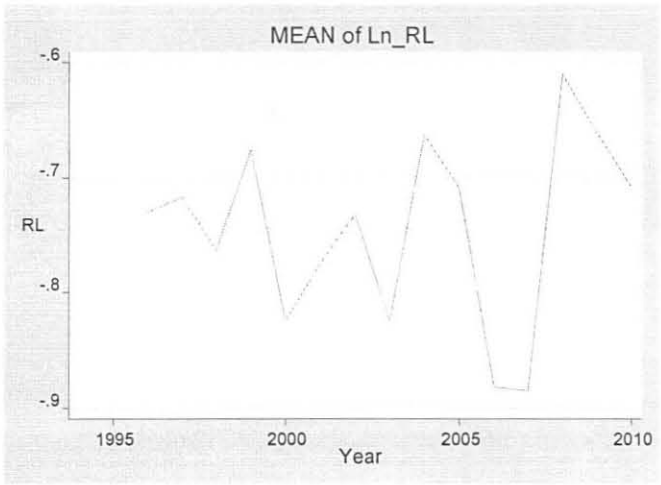
Independent Variable	**Dependent variable Ln_FDI in % GDP**		
	Fixed effects	Random effects (GLS)	**Fixed effects^**
	(1)	(2)	(3)
Ln_GDP/Capita	0.3283339* (0.1924747)	0.1797941 (0.1660469)	0.3838016* (0.2029647)
Ln_Infrastructure	0.4400235** (0.191175)	0.2201357 (0.1627638)	0.5547784*** (0.196104)
Ln_Natural Resource	0.0540796 (0.0542573)	0.0995875** (0.0490557)	0.1057578* (0.0591067)
Macro/police Variables			
Ln_Openness	0.924953** (0.3594047)	0.9242602*** (0.306556)	0.4612125 (0.4058032)
Ln_Financial Devt.	0.3541443** (0.1502286)	0.1873071 (0.1403089)	0.2649226* (0.1524674)
Lag Ln_Inflation	-0.0236091 (0.0495846)	-0.0256149 (0.049483)	-0.0352706 (0.0524564)
Ln_Real exchange Rate	0.1105693** (0.0589109)	0.0702995 (0.047589)	0.0736608 (0.0553701)
Institutional quality	0.6667575** (0.2560649)	0.5316491** (0.2244848)	0.4312063 (0.24978)
Constant	-7.714779*** (1.700136)	-5.760855*** (1.435406)	-5.895592*** (1.76984)
R-sq:(overall)	0.1153	0.1347	0.0279
F.stat (p value)	8.44(0.0000)	6.42 (0.0000)	6.84 (0.0000)
Wald chi2, p-value		61.36 (0.0000)	
Number of obs	480	480	330
Number of countries	32	32	22

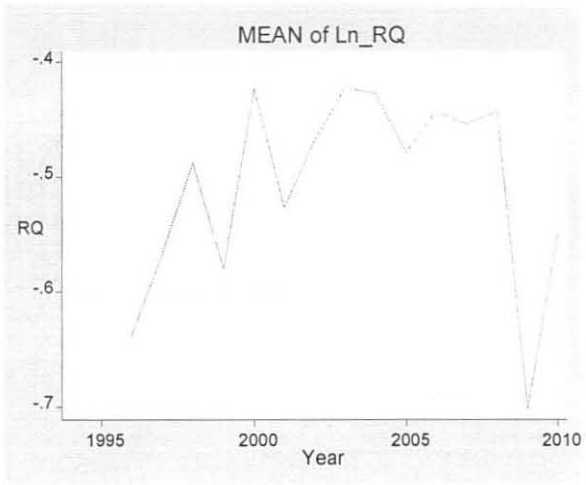
Notes: Std. Errs. are in parentheses and ***, ** and * denote significance at 1%, 5% and 10% levels respectively.
^ : Fixed effect estimation result for relatively natural recourses endowed countries.

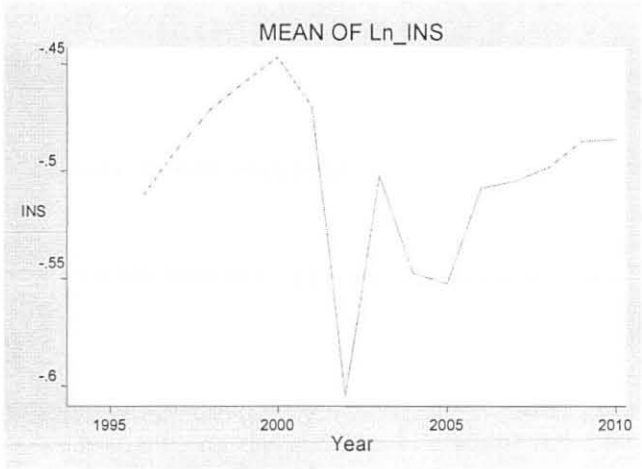
Appendix – C: Tread of Variables understudy

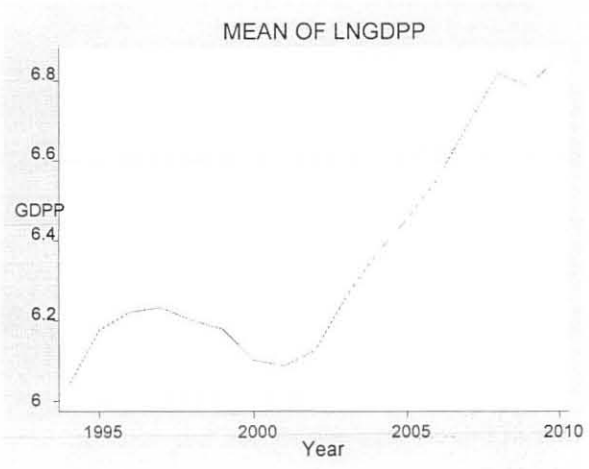


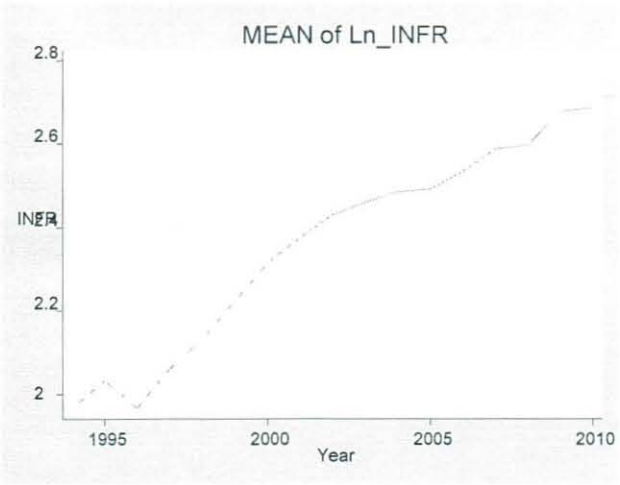


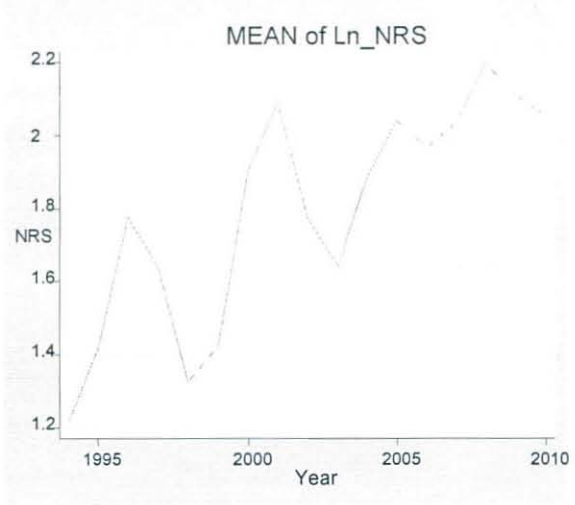


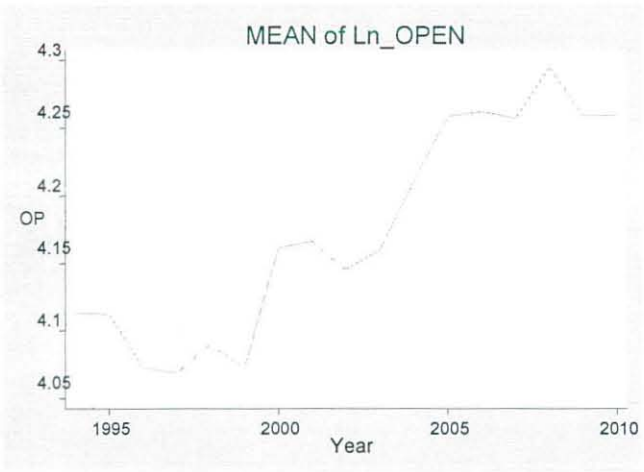


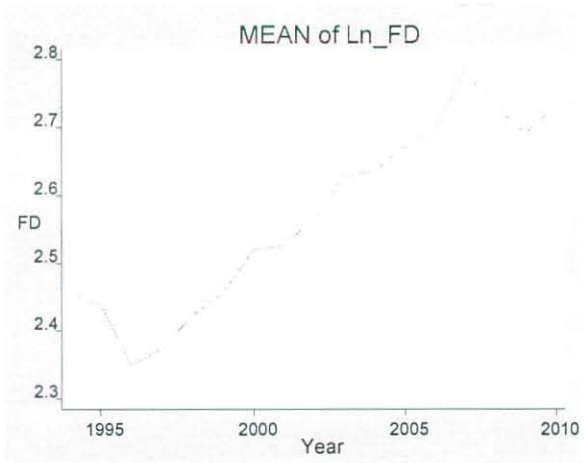


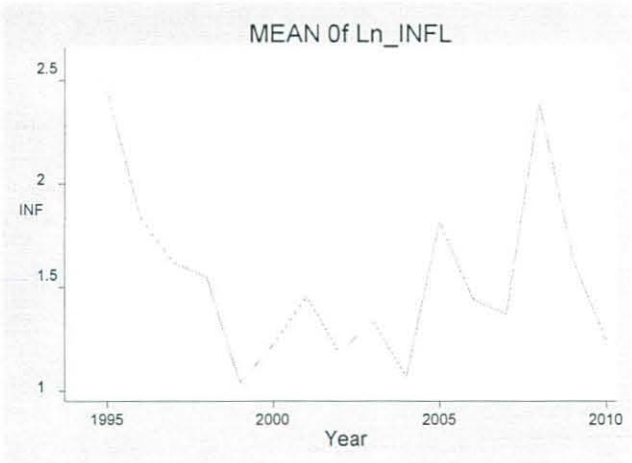


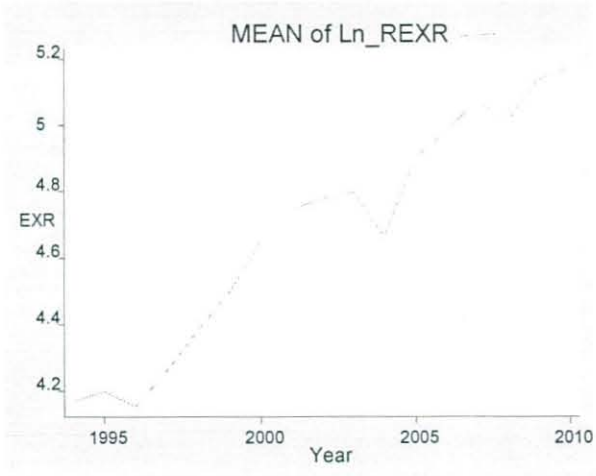

MEAN of Ln_INFR
2.8
2.6
INFR
2.2
2
1995
2000
2005
2010
Year


MEAN of Ln_NRS
2.2
2
1.8
NRS
1.6
1.4
1.2
1995
2000
2005
2010
Year


MEAN of Ln_OPEN
4.3
4.25
4.2
OP
4.15
4.1
4.05
1995
2000
2005
2010
Year


MEAN of Ln_FD
2.8
2.7
2.6
FD
2.5
2.4
2.3
1995
2000
2005
2010
Year


MEAN 0f Ln_INFL
2.5
2
INF
1.5
1
1995
2000
2005
2010
Year


MEAN of Ln_REXR
5.2
5
4.8
EXR
4.6
4.4
4.2
1995
2000
2005
2010
Year

Appendix - D : Regression Results ofEconometric models & TESTS

Result of Fixed Effects Model for individual institutional indicator

```
Fixed-effects (within) regression               Number of obs      =       480
Group variable: id                              Number of groups   =        32

R-sq:  within  = 0.1310                         Obs per group: min =        15
       between = 0.1428                                        avg =      15.0
       overall = 0.1150                                        max =        15

                                                F(10,438)          =      6.60
corr(u_i, Xb)  = -0.5420                        Prob > F           =    0.0000
```

fdi	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
cc	.0474169	.1193914	0.40	0.691	-.1872344	.2820681
rl	.03312	.0894584	0.37	0.711	-.142701	.208941
rq	.256574	.1129489	2.27	0.024	.0345848	.4785631
gdpp	.3836235	.1957812	1.96	0.051	-.0011638	.7684108
infr	.39565	.1920438	2.06	0.040	.018208	.7730919
op	.9627559	.3613284	2.66	0.008	.2526028	1.672909
nrs	.060869	.0549004	1.11	0.268	-.0470319	.1687699
fd	.3555723	.1509573	2.36	0.019	.0588817	.6522629
infl L1.	-.0158406	.0498028	-0.32	0.751	-.1137227	.0820415
rexr	.0922799	.0583819	1.58	0.115	-.0224636	.2070235
_cons	-8.209442	1.696673	-4.84	0.000	-11.54407	-4.874809
sigma_u	1.4180592					
sigma_e	1.1477098					
rho	.60421081	(fraction of variance due to u_i)				

F test that all u_i=0: F(31, 438) = 12.45 Prob > F = 0.0000

Result of Random Effects Model for individual institutional indicator

```
Random-effects GLS regression                   Number of obs      =       480
Group variable: id                              Number of groups   =        32

R-sq:  within  = 0.1222                         Obs per group: min =        15
       between = 0.1799                                        avg =      15.0
       overall = 0.1408                                        max =        15

Random effects u_i ~ Gaussian                   Wald chi2(10)      =     62.80
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000
```

fdi	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
cc	.0209056	.1199943	0.17	0.862	-.2142788	.2560901
rl	.0216664	.0896828	0.24	0.809	-.1541087	.1974415
rq	.2982953	.1128829	2.64	0.008	.0770489	.5195417
gdpp	.2460669	.164885	1.49	0.136	-.0771019	.5692356
infr	.1996893	.162044	1.23	0.218	-.1179111	.5172897
op	.9366297	.3050111	3.07	0.002	.338819	1.53444
nrs	.1026244	.0492179	2.09	0.037	.0061592	.1990897
fd	.1755974	.1400017	1.25	0.210	-.0988009	.4499956
infl L1.	-.0179942	.0496368	-0.36	0.717	-.1152805	.0792922
rexr	.0575226	.0469776	1.22	0.221	-.0345517	.1495969
_cons	-6.199358	1.383249	-4.48	0.000	-8.910476	-3.48824
sigma_u	.9314066					
sigma_e	1.1477098					
rho	.39707787	(fraction of variance due to u_i)				

Result of Fixed _ Effects Model for Institutional quality

```
Fixed-effects (within) regression               Number of obs      =       480
Group variable: id                              Number of groups   =        32

R-sq:  within  = 0.1331                         Obs per group: min =        15
       between = 0.1475                                        avg =      15.0
       overall = 0.1153                                        max =        15

                                                F(8,440)           =      8.44
corr(u_i, Xb)  = -0.6045                        Prob > F           =    0.0000
```

fdi	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ins	.6667575	.2560649	2.60	0.010	.1634951	1.17002
gdpp	.3283339	.1924747	1.71	0.089	-.0499501	.7066178
infr	.4400235	.191175	2.30	0.022	.0642938	.8157531
op	.924953	.3594047	2.57	0.010	.2185898	1.631316
nrs	.0540796	.0542573	1.00	0.319	-.0525561	.1607154
fd	.3541443	.1502286	2.36	0.019	.0588895	.6493991
infl L1.	-.0236091	.0495846	-0.48	0.634	-.1210611	.0738429
rexr	.1105693	.0589109	1.88	0.061	-.0052125	.2263511
_cons	-7.714779	1.700136	-4.54	0.000	-11.05618	-4.373382
sigma_u	1.4970861					
sigma_e	1.143722					
rho	.6314554	(fraction of variance due to u_i)				

F test that all u_i=0: F(31, 440) = 12.92 Prob > F = 0.0000

Result of Random Effects Model for Institutional quality

```
Random-effects GLS regression                   Number of obs      =       480
Group variable: id                              Number of groups   =        32

R-sq:  within  = 0.1248                         Obs per group: min =        15
       between = 0.1742                                        avg =      15.0
       overall = 0.1347                                        max =        15

Random effects u_i ~ Gaussian                   Wald chi2(8)       =     61.36
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000
```

fdi	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ins	.5316491	.2244848	2.37	0.018	.0916669	.9716313
gdpp	.1797941	.1660469	1.08	0.279	-.1456518	.5052401
infr	.2201357	.1627638	1.35	0.176	-.0988756	.5391469
op	.9242602	.306556	3.01	0.003	.3234214	1.525099
nrs	.0995875	.0490557	2.03	0.042	.00344	.195735
fd	.1873071	.1403089	1.33	0.182	-.0876932	.4623075
infl L1.	-.0256149	.049483	-0.52	0.605	-.1225999	.0713701
rexr	.0702995	.047589	1.48	0.140	-.0229732	.1635723
_cons	-5.760855	1.435406	-4.01	0.000	-8.5742	-2.94751
sigma_u	.97275212					
sigma_e	1.143722					
rho	.4197432	(fraction of variance due to u_i)				

.

Hausman(1978) Test for Fixed versus Random Effect Model individual indicator

	Coefficients (b) fixed_effe~s	(B) .	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
cc	.0474169	.0209056	.0265112	.
rl	.03312	.0216664	.0114536	.
rq	.256574	.2982953	-.0417213	.0038606
gdpp	.3836235	.2460669	.1375566	.1055613
infr	.39565	.1996893	.1959607	.1030658
op	.9627559	.9366297	.0261261	.1937175
nrs	.060869	.1026244	-.0417554	.0243239
fd	.3555723	.1755974	.1799749	.0564591
L.infl	-.0158406	-.0179942	.0021536	.0040624
rexr	.0922799	.0575226	.0347573	.0346635

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(10) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 92.04
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

Hausman(1978) Test for Fixed versus Random Effect Model for institutional quality

	Coefficients (b) fixed_effe~s	(B) .	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
ins	.6667575	.5316491	.1351084	.1231901
gdpp	.3283339	.1797941	.1485397	.0973392
infr	.4400235	.2201357	.2198878	.1002787
op	.924953	.9242602	.0006928	.1876036
nrs	.0540796	.0995875	-.0455079	.0231818
fd	.3541443	.1873071	.1668372	.0536847
L.infl	-.0236091	-.0256149	.0020058	.0031712
rexr	.1105693	.0702995	.0402698	.0347244

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)
= 83.63
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

Result of Fixed Effects Model for Relatively Natural Resource Endowed countries

Fixed-effects (within) regression — Number of obs = 330
Group variable: id — Number of groups = 22

R-sq: within = 0.1702 — Obs per group: min = 15
between = 0.0016 — avg = 15.0
overall = 0.0292 — max = 15

F(10,298) = 6.11
corr(u_i, Xb) = -0.6867 — Prob > F = 0.0000

fdi	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
cc	-.0955993	.1280352	-0.75	0.456	-.3475669	.1563683
rl	.153264	.1036161	1.48	0.140	-.0506479	.357176
rq	.3251411	.1218364	2.67	0.008	.0853724	.5649098
gdpp	.3815929	.2044228	1.87	0.063	-.0207022	.783888
infr	.5175024	.1954128	2.65	0.009	.1329386	.9020663
op	.5089765	.4023201	1.27	0.207	-.2827721	1.300725
nrs	.1071563	.05893	1.82	0.070	-.0088153	.223128
fd	.2594817	.1515041	1.71	0.088	-.0386718	.5576352
infl L1.	-.0345126	.0522356	-0.66	0.509	-.1373099	.0682847
rexr	.0656915	.0545006	1.21	0.229	-.0415632	.1729463
_cons	-5.957457	1.737663	-3.43	0.001	-9.377102	-2.537812
sigma_u	1.1764076					
sigma_e	1.0389197					
rho	.56182398	(fraction of variance due to u_i)				

F test that all u_i=0: F(21, 298) = 8.37 — Prob > F = 0.0000

Fixed-effects (within) regression — Number of obs = 330
Group variable: id — Number of groups = 22

R-sq: within = 0.1542 — Obs per group: min = 15
between = 0.0057 — avg = 15.0
overall = 0.0279 — max = 15

F(8,300) = 6.84
corr(u_i, Xb) = -0.7221 — Prob > F = 0.0000

fdi	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ins	.4312063	.24978	1.73	0.085	-.0603365	.9227492
gdpp	.3838016	.2029647	1.89	0.060	-.0156134	.7832165
infr	.5547784	.196104	2.83	0.005	.1688648	.940692
op	.4612125	.4058032	1.14	0.257	-.3373688	1.259794
nrs	.1057578	.0591067	1.79	0.075	-.0105586	.2220741
fd	.2649226	.1524674	1.74	0.083	-.0351186	.5649637
infl L1.	-.0352706	.0524564	-0.67	0.502	-.1384997	.0679586
rexr	.0736608	.0553701	1.33	0.184	-.0353021	.1826238
_cons	-5.895592	1.76984	-3.33	0.001	-9.378465	-2.412718
sigma_u	1.2213743					
sigma_e	1.0453952					
rho	.57716924	(fraction of variance due to u_i)				

test that all u_i=0: F(21, 300) = 8.00 — Prob > F = 0.0000

Result of System GMM without Interaction for all individual governance Indicators

```
System dynamic panel-data estimation          Number of obs      =       480
Group variable: id                            Number of groups   =        32
Time variable: year
                                              Obs per group:  min =        15
                                                              avg =        15
                                                              max =        15

Number of instruments =    278                Wald chi2(11)      =    207.11
                                              Prob > chi2        =    0.0000
One-step results
```

fdi	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
fdi						
L1.	.3718766	.0396892	9.37	0.000	.2940872	.4496661
nrs	.1338594	.0576093	2.32	0.020	.0209473	.2467716
cc	-.0335201	.1309104	-0.26	0.798	-.2900997	.2230595
rl	.1200563	.0987494	1.22	0.224	-.0734889	.3136016
rq	.2898495	.1218989	2.38	0.017	.050932	.5287669
gdpp	.4291484	.188181	2.28	0.023	.0603205	.7979762
infr	.2659878	.1927007	1.38	0.167	-.1116986	.6436742
op	.9391536	.3318888	2.83	0.005	.2886636	1.589644
fd	-.4766727	.1589624	-3.00	0.003	-.7882334	-.1651121
infl						
L1.	-.0371698	.0499168	-0.74	0.456	-.135005	.0606654
rexr	-.0294145	.0563615	-0.52	0.602	-.139881	.0810521
_cons	-5.588463	1.443909	-3.87	0.000	-8.418472	-2.758453

```
Instruments for differenced equation
        GMM-type: L(2/.).fdi L(2/.).nrs
        Standard: D.cc D.rl D.rq D.gdpp D.infr D.op D.fd LD.infl D.rexr
Instruments for level equation
        GMM-type: LD.fdi LD.nrs
        Standard: _cons
```

Sargan Tests

```
Sargan test of overidentifying restrictions
        H0: overidentifying restrictions are valid

        chi2(266)     =  286.5826
        Prob > chi2   =    0.1843
```

Autocorrelation Test

```
Artests not computed for one-step system estimator with vce(gmm)

Arellano-Bond test for zero autocorrelation in first-differenced errors
```

Order	z	Prob > z
1	-3.0041	0.0027
2	1.1388	0.2548

```
H0: no autocorrelation
```

Result of System GMM without Interaction for Institutional quality

System dynamic panel-data estimation — Number of obs = 480
Group variable: id — Number of groups = 32
Time variable: year
Obs per group: min = 15, avg = 15, max = 15

Number of instruments = 276 — Wald chi2(9) = 208.91
Prob > chi2 = 0.0000

One-step results

fdi	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
fdi						
L1.	.3564374	.0400791	8.89	0.000	.2778839	.434991
nrs	.1321203	.0571379	2.31	0.021	.020132	.2441086
ins	.6566952	.2354538	2.79	0.005	.1952143	1.118176
gdpp	.3927718	.1846729	2.13	0.033	.0308196	.7547241
infr	.2833326	.1897703	1.49	0.135	-.0886103	.6552756
op	.9025485	.3310646	2.73	0.006	.2536739	1.551423
fd	-.4750544	.1581992	-3.00	0.003	-.785119	-.1649897
infl						
L1.	-.0468048	.0493768	-0.95	0.343	-.1435815	.0499719
rexr	-.01826	.0552401	-0.33	0.741	-.1265286	.0900087
_cons	-5.160547	1.468182	-3.51	0.000	-8.03813	-2.282963

Instruments for differenced equation
GMM-type: L(2/.).fdi L(2/.).nrs
Standard: D.ins D.gdpp D.infr D.op D.fd LD.infl D.rexr
Instruments for level equation
GMM-type: LD.fdi LD.nrs
Standard: _cons

Sargan Tests

Sargan test of overidentifying restrictions
H0: overidentifying restrictions are valid

chi2(266) = 286.6615
Prob > chi2 = 0.1834

Autocorrelation Test

Artests not computed for one-step system estimator with vce(gmm)

Arellano-Bond test for zero autocorrelation in first-differenced errors

Order	z	Prob > z
1	-3.022	0.0025
2	1.1995	0.2303

H0: no autocorrelation

Result of System GMM with Interaction for individual indicator

```
System dynamic panel-data estimation          Number of obs      =       480
Group variable: id                            Number of groups   =        32
Time variable: year
                                              Obs per group:  min =        15
                                                              avg =        15
                                                              max =        15

Number of instruments =    277                Wald chi2(10)      =    200.16
                                              Prob > chi2        =    0.0000
One-step results
```

fdi	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
fdi						
L1.	.3744506	.0397214	9.43	0.000	.2965982	.452303
nrs	.1339209	.0580778	2.31	0.021	.0200905	.2477512
cc	-.0429583	.1301586	-0.33	0.741	-.2980643	.2121478
rl	.1169421	.0987939	1.18	0.237	-.0766904	.3105745
gdpp	.3878817	.1877127	2.07	0.039	.0199716	.7557919
infr	.2221993	.1927823	1.15	0.249	-.155647	.6000457
op	.8294575	.3279466	2.53	0.011	.186694	1.472221
rqfd	.1279163	.0452313	2.83	0.005	.0392646	.216568
infl						
L1.	-.0212819	.0494655	-0.43	0.667	-.1182325	.0756688
rexr	-.0194787	.0562227	-0.35	0.729	-.1296732	.0907158
_cons	-6.065215	1.430722	-4.24	0.000	-8.869378	-3.261052

```
Instruments for differenced equation
        GMM-type: L(2/.).fdi L(2/.).nrs
        Standard: D.cc D.rl D.gdpp D.infr D.op D.rqfd LD.infl D.rexr
Instruments for level equation
        GMM-type: LD.fdi LD.nrs
        Standard: _cons
```

Sargan Tests

```
Sargan test of overidentifying restrictions
        H0: overidentifying restrictions are valid

        chi2(266)     =  292.366
        Prob > chi2   =    0.1280
```

Autocorrelation Test

```
Artests not computed for one-step system estimator with vce(gmm)

Arellano-Bond test for zero autocorrelation in first-differenced errors
```

Order	z	Prob > z
1	-3.0009	0.0027
2	1.1344	0.2566

```
H0: no autocorrelation
```

Result of System GMM with Interaction for institutional quality

System dynamic panel-data estimation — Number of obs = 480
Group variable: id — Number of groups = 32
Time variable: year
Obs per group: min = 15, avg = 15, max = 15

Number of instruments = 276 — Wald chi2(9) = 205.48
Prob > chi2 = 0.0000

One-step results

fdi	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
fdi						
L1.	.361106	.0399651	9.04	0.000	.2827759	.4394362
nrs	.1381066	.0576417	2.40	0.017	.025131	.2510823
ins	.5233458	.2396963	2.18	0.029	.0535496	.9931419
gdpp	.3831364	.1844963	2.08	0.038	.0215303	.7447426
infr	.1869472	.1912518	0.98	0.328	-.1878993	.5617938
op	.7380286	.3280737	2.25	0.024	.095016	1.381041
rqfd	.1050556	.0456404	2.30	0.021	.015602	.1945092
infl						
L1.	-.023547	.0488769	-0.48	0.630	-.119344	.0722501
rexr	-.0059089	.0549	-0.11	0.914	-.1135109	.1016932
_cons	-5.45381	1.460064	-3.74	0.000	-8.315483	-2.592137

Instruments for differenced equation
GMM-type: L(2/.).fdi L(2/.).nrs
Standard: D.ins D.gdpp D.infr D.op D.rqfd LD.infl D.rexr
Instruments for level equation
GMM-type: LD.fdi LD.nrs
Standard: _cons

Sargan Tests

Sargan test of overidentifying restrictions
H0: overidentifying restrictions are valid

chi2(266) = 292.8902
Prob > chi2 = 0.1236

Autocorrelation Test

Artests not computed for one-step system estimator with vce(gmm)

Arellano-Bond test for zero autocorrelation in first-differenced errors

Order	z	Prob > z
1	-2.9925	0.0028
2	1.1451	0.2521

H0: no autocorrelation

Declaration:

I, the undersigned, declare that this research project is my original work and has not been presented in any other university, and that all sorts of materials used for this project/thesis have been duly acknowledged.

The examiners' comments have been duly incorporated.

Declared by

Name: Getachew Melese

Signature: _____

Date: 18/06/04

Confirmed by:

Name: Fantu Guta

Signature: _____

Date: 18/06/12

Place and data of Submission : _____