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Full Length Research Paper

Corruption, foreign direct investment and economic growth in Nigeria: An empirical investigation

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This paper investigates the causality and effect of corruption on the foreign direct investment inflow to Nigeria. The foreign direct investment (FDI) inflow into developing countries including African countries is a source of employment and economic growth. The study also examines the relationship between inflow of FDI and economic growth in Nigeria. The paper employs Granger causality test and Ordinary Least Square method. The data employed is purely time series (secondary) data, covering 1990 and 2009. The sources of these data are Central Bank of Nigeria Statistical Bulletin and the Federal Bureau of Statistics. The variables used are FDI inflow, Corruption Index, Exchange Rate, Inflation Rate, Gross Domestic Product for model one. For model two the variables are Gross Domestic Product, Government Expenditure, FDI and Gross Fixed Capital Formation. Using Augmented Dickey Fuller (ADF) test, the results reveal that all the variables are stationary at first difference. The Johansen and Juselius Co-integration test indicates existence of four co-integrating vectors indicating the existence of a long-run relationship between FDI inflow and low level of corruption. The OLS result shows that there is an inverse relationship between FDI inflow and corruption. In other words, a large volume of FDI inflow is associated with a low level of corruption in the host countries. The exchange rate depreciation and inflation rate are significant determinants of FDI inflow to Nigeria. Also, there is a significant positive relationship between FDI inflow and economic growth in Nigeria. However, government expenditure shows an inverse relationship with GDP. The study concludes that for Nigeria to attract a large volume of FDI inflow corruption at all levels of governance must be drastically reduced and checkmated. The paper recommends that the activities of the anti-corruption agencies in Nigeria such as the Economic and Financial Crimes Commission (EFCC) and the Independent Corrupt Practices and Related Offences Commission (ICPC) should be strengthened.

Keywords: Economic growth, Corruptions, Foreign investment.

INTRODUCTION

The importance of foreign capital for the development of the economies of third world nations like Nigeria has been well researched and documented (e.g Dutse, 2008). Many studies have shown that the single largest component of net capital inflows to emerging markets is foreign direct investment (Deutsche Bundesbank, 2003). Many experts have argued that foreign direct investment (FDI) is capable of accelerating the process of economic

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growth of a developing country (Obiwona, 2001). Research has shown that most developing countries including Nigeria have not appreciably exploited Foreign Direct Investment (FDI) as a source of external financing of the economy due to a non-conducive investment climate and the attitude of the host nations (e.g Asiedu, 2002; Balasubramanyam, 2001).Empirical evidence has shown that foreign direct investment responds to economic fundamentals, official policies and financial market practices (Dinda, 2009; Taylor and Sarno, 1997).Among the benefits that are said to be associated with the inflow of properly utilized FDI are the assistance if offers developing counties to acquire advanced technology and critical managerial skills which can increase local productivity, create additional jobs, lower production costs and provide workers with higher wages (Cohen, 2007). In addition to the foregoing, it has been argued that FDI helps developing countries in supplementing their domestic savings by making available capital from overseas which is very important because domestic capital markets in such countries are usually inadequate for the financing of the corporate sector (Adeoye, 2009). It is further argued that FDI helps developing countries to gain access to foreign markets for goods and services for the people of the recipient country (Obiwona, 2001). In summary, the protagonists of FDI are of the view that it can make a positive contribution to the host economy by supplying capital, technology and management resources that would otherwise not be available in addition to bringing jobs to a host country that would otherwise not be created there (Hill, 2003). All of these benefits have been identified as indispensable factors for the economic growth and development of a third world nation. However, some critics of FDI have argued that the damage FDI has done to the economies of their host nations is enormous. The positive contribution arising from the resource transfer-effects are said to be negated by the possible adverse effects of FDI on competition within the host nation, the adverse effects on the host country's balance of payments and the perceived loss of national sovereignty and autonomy (Hill, 2003). Some other frequently mentioned criticisms of FDI include the domination and exploitation of host countries to the exclusive benefit of the home source of the FDI can cause to host countries in some primary sectors in the process of providing goods and raw materials for advanced country markets (Kragman and Obstfeld, 2006).Although these criticism appear logical, credible and convincing, empirical evidence and statistical reports suggest that the benefit which FDI offers outweigh its costs to the host countries (OECD, 2002). Indeed, the criticisms notwithstanding, many Federal and State Government officials in Nigeria including Federal Ministers and State Governors continue to visit advanced nations of the world including USA, Europe, Canada, Australia, South Korea, China and Japan to look for foreign investors in addition to offering incentives to foreign firms such as tax incentives, low interest loan, grants, subsidies, increased spending on infrastructure, the creation of export processing zones and other concessions. While such efforts appear necessary to facilitate the inflow of foreign capital for the development of Nigeria's economy, the success of the initiative may be short lived because it depends largely on whether the Nigerian government is able to create an appropriate and positive business environment that can reduce the incidence of corruption and free investors from its negative impact. In a country where the state of business and economic infrastructure such as roads, power and security is generally considered deficient and parlous, a high incidence of corruption may further discourage foreign investors and the inflow of FDI. Not much attention has been given in previous studies to the role of corruption in determining FDI trends in Nigeria. For instance an empirical investigation of factors attracting FDI to Nigeria by Dinda (2009) used only market size, exchange rate, inflation rate, openness and natural resources as study variables. The study did not take into consideration the role of corruption and other macro-level corporate governance factors. The study by Asiedu (2002, 2006) of the determinants of foreign direct investment in Africa explored the impact of corruption and other variables including natural resources, market size, host country's investment policy and political instability on FDI inflow. However, Asiedu's (2002, 2006) study did not reveal much about the depth and impact of corruption on FDI inflow into Nigeria because of the cross-sectional nature of the study. A study which focuses on Nigeria is considered necessary to provide a detailed understanding of the variables at work.

The aims of this study are to: i) Test the corruption – FDI hypothesis empirically using econometric method and time series data and determine its importance among other variables as a driver of inward FDI levels; ii) to determine and assess the relationship between the volume of FDI and the level of economic growth in Nigeria. Since there are other key determinants of flow FDI into a country, the other determinants of FDI will be used in the regression model to enable us isolate the relative impact of corruption.

Conceptual Framework

Before we proceed with this study, some study constructs need to be defined in order to provide specific clarifications as to the context in which they are used as well as a basis for a clear measurement of the study variables. The three major constructs are corruption, foreign direct investment (FDI) and economic growth.

Corruption

According to Transparency International (2010), corruption is the abuse of entrusted power for private gain. Corruption is a value concept which broadly defined means immorality, moral debasement and depravity. Ogundele and Opeifa (2004), describe corruption as consisting of several elements including deceit, trickery, cheating, intentional deception, dishonesty and the conscious premeditated action of a person or group of persons to alter the facts of a matter or transaction for the purpose of selfish personal gains. This means that corruption involves an intentional perversion of the truth or a deliberate manipulation of facts and situation at one's disposal to gain illegitimate material and non-material advantages. Therefore, a corrupt act may be seen as both immoral and illegal. In this study, we adopt Bardhan's (1997) definition of corruption as the practice whereby a government official demands bribes from a foreign business in return for the right to operate in a country, industry or location.

Foreign Direct Investment (FDI)

Foreign Direct Investment (FDI) has been defined as the investment of resources in business activities outside a firm's home country (Hill, 2003). OECD (1996), IMF (1999), and Adeoye (2009), define FDI as the long term investment that reflects the objective of a lasting interest and control by a resident entity of one economy (the direct investor) in an enterprise that is resident in another economy (the direct investment enterprise).The lasting interest reflects the continuation of a long-term relationship between the direct investor and the enterprise and a considerable level of influence on the management of the enterprise. According to the above definition, the terms "control" or "influence" and "long term" are used to make a distinction between FDI and international portfolio investment. Because FDI is about both ownership and control, such investments tend to be long term in their focus hence they are different from IPF which is a short term investment where the investor does not seek to control the firm (Adeoye, 2009). Mwillima (2003) defines FDI as any investment made that leads to the acquisition of a lasting ownership and control interest (usually at least 10% of voting stock) and at least 10% of equity share in an enterprise operating in a country other than the home country of the investor. Mallampally and Sauvant (1999), define FDI as investments by multinational corporations in foreign countries with the aim of controlling assets and managing production activities in those countries. Annaek (2007) defines Foreign Direct Investment as the process whereby people in one country obtain ownership of assets for the purpose of gaining control over the production, distribution and other activities of a firm in a foreign country. An expanded explanation of the operational meaning of FDI has been offered by Ayanwale (2007) as ownership of at least 10% of the ordinary shares or voting stock in a foreign enterprise. Thus, ownership of 10% ordinary shares is the criterion for the existence of a direct investment relationship while ownership of less than 10% is recorded as portfolio investment. From the foregoing definitions, it is clear that an agreed meaning of FDI exists in the literature (Dutse, 2008). In this study we adopt the definition proposed by OECD (1996) and IMF (1999). This definition has been used in most studies on this subject.

Economic Growth

The concept of economic growth has been used synonymously with economic development and is associated with such things as growth in population, development of resources, technological advancement and increasing capital formation. Economic growth means growth in the level of output produced by a country over a certain period of time. It is a useful measure of economic performance of a country. Performance here means the degree of correspondence between actual output and the maximum output that could be realized if, given the pattern of demand, all the resources and the most advanced technology available were used to full advantage.

According to Olamade (1999), economic growth is defined as long-term change in an economy's productive capacity. The productive capacity of the economy is the output that could be produced if all of the economy's resources were fully and efficiently employed. The definition links economic growth to rate of growth of potential output which is related to the rate of growth of labour force and of productivity. The determinants of economic growth in the long run include technological progress and population growth and accumulation of capital.

The Wikipedia Free Encyclopedia (2010) defines economic growth as an increase (or decrease) in the value of goods and services that a geographic area produces and sells compared to an earlier time. If the value of an area's goods and services is higher in one year than the year before, it experiences positive growth, usually simply called "economic growth". In a year when less value than the year before is produced and sold, it experiences "negative economic growth," also called "recession" or "depression".

Economic growth can occur due to an increase in the number of goods or services but such an increase must be sustained over a long time. It can also occur due to

production of more expensive goods and services.

Literature Review

The literature on foreign direct investment is dominated by results of studies that attempt to determine the effects of FDI on the economies of recipient countries and those that seek to determine the factors that influence or attract the flow of FDI to a country. This literature review will cover both aspects of the subject with particular focus on the impact of corruption on inward FDI. We will also review the evidence in the literature on the other determinants of FDI flow to a developing country. This will help us form the basis for selecting the control variables for the panel data regression because corruption may be more or less important than other determinants of FDI. The literature review will point out the determinants to be included in the model to be developed in the methodology.

One of the determinants of inward FDI to a country that is commonly cited in the literature is corruption which is an element of macro-level corporate governance. 'Graft' which was described as the political corruption encountered by firms in order to carry out their transactions was one of the World Banks' corporate governance indicators used by Kauffman et al (1999) to determine the level of inward FDI to a country.

In a study of corruption and global capital flows to emerging countries, Wei and Shleifer (2000), found that corruption affects both the volume and the composition of capital inflows into emerging markets negatively because it reduces inward FDI substantially. They found that FDI is more susceptible and vulnerable to corruption than foreign portfolio investment and other forms of capital inflows. A plausible explanation for this may be due to the fact that corruption interferes directly with operations involving FDI (Adeoye, 2009). Another study by Shleifer and Visny (1993) found that corruption reduces the incentives for businesses to invest. In a study of corruption and growth, Mauro (1995), found that corruption had a significant negative impact on a country's economic growth rate. Economists have often argued that were corruption is common; the profits from a business activity may be siphoned off by unproductive bureaucrats who demand side payments for granting the enterprise permission to operate. This reduces the incentives for businesses to invest and may hamper a country's economic growth rate (Shleifer and Visny, 1993).

Although most of the literature on the relationship between corruption and FDI suggest a negative relationship between corruption and FDI, some economists have argued and theorized that in a country where there are cumbersome regulations and the political structures distort, fluster or limit the workings of the market mechanism, corruption in the form of black Marketeering, smuggling, and making side payments to government bureaucrats and other functionaries to speed up approval for business investments may actually enhance the welfare of the people of such a country because investments that are facilitated by such side payments can bring substantial benefits to the local populace in terms of income and jobs which such countries badly need. The theory is that the practice of making side payments may be the price that must be paid by foreign businesses to bring about a greater good provided the investments made by such firms create jobs where none existed before and provided that the practice is not illegal (Bardhan, 1997).

Given the debate and complexity of this issue, one might conclude that generalization is difficult and dangerous because the evidence is mixed and inconclusive hence more investigation is needed on this matter. A study by Kurtzman et al (2004) measured the effect of corruption among other factors on FDI using data from a group of countries. They found that a high level of corruption strongly correlated with a low level of inward FDI. However, the use of correlation models for the analysis makes it impossible to determine whether or not corruption results in a reduction in inward FDI flows to the selected countries (Adeoye, 2009). Wheeler and Mody (1992) and Hines (1995) incorporate corruption as an institutional or macro level corporate governance factor in the determination of inward FDI flow. The results of their analysis support the position of most previous researches that corruption exerts a negative influence on FDI. A study of FDI inflow into some African countries by Asideu (2006) also showed that corruption influenced the level of FDI negatively.

Although the significance of corruption as a determinant of FDI is well noted in the literature, it is not the only factor that affects inward FDI. Attention has been given to many other factors in the literature in explaining the level and direction of FDI to developing countries. Among such other determinants that have been reported in the literature are market profitability (Ohlin, 1993; Nonnenberg and Mendoca, 2004), the domestic market size (Asiedu, 2002, 2006; Obadan, 1982; Anyanwu, 1998; Iyoha, 2001; Balasubramanyam, 2001; Loree and Guisinger, !995), human capital development measured by the productivity of local workforce (Globerman and Shapiro, 2003; Kinoshita and Campos, 2004; Miyamoto, 2003), and political risk and stability (Wheeler and Mody, 1992; Hines, 1995, Asiedu, 2002, 2006). Some other factors that are commonly cited in the FDI literature are availability of abundant natural resources (Dinda, 2009; Kinoshita and Campos, 2004), macro-economic instability and uncertainty as measured by external debt and inflation rate (Iyoha, 2001, Singh and Jun, 1995; Asiedu 2002, Kinoshita and campos, 2004, Dinda, 2009; Nonnenberg and Mendonca, 2004; Ojeaburu, 2011), openness of the economy to international trade (Dinda, 2009, Nunnenkamp and Spatz, 2002; Nonnenberg and

Mendonca, 2004), infrastructure development (Ojeaburu, 2011; Balasubramanyam, 2001; Loree and Guisinger, 1995) and foreign exchange rates (Globerman and Shapiro, 2003; Goldberg and Kolstad, 1995). Some other determinants of FDI that have been mentioned in the literature are distance from major markets and agglomeration economies as well as labour costs and bureaucratic efficiency (Kinoshita and Campos, 2004) tax incentive and other investment concessions (Margalioth, 2003; Goodspeed et al, 2006), the extent of liberalization or otherwise of the financial sector (Ojeaburu, 2011), the availability of modern information and communication technology infrastructure (Gholami et al, 2006) as well as the legal and regulatory environment and how rules are implemented in practice.

All the studies reviewed above analyze the determinants of FDI from the perspective of the eclectic theory of international investment which argues that FDI is driven by the objectives of achieving advantages of foreign ownership (Hymer, 1996), internationalization and efficiency from cross-border transactions (Brickley and Casson, 1976) and host country location specific advantages such as a large market, a lower cost of resources or superior infrastructure and a favourable social and legal environment (Veron, 1996).

The general findings and conclusions reported in the literature show that inward FDI is a complex and multi-faceted issue. Despite the usefulness of such findings, more country specific investigations using the econometric method and time series data are needed to provide a detailed understanding of the forces at work. This is important so as to be able to isolate factors that are critically important in each situation and to develop appropriate situation specific policy frameworks and initiatives to respond to the challenges that are posed by such factors.

For instance, the most widely perceived and acknowledged problem at the macro-level of governance in Nigeria is corruption (Ogundele, et al 2007). The media in Nigeria is awash almost every day with reports of corrupt acts by top officials of government at all levels. The Helliburton scandal and the Siemen scam involving several billions of Naira in side payments to Nigeria Federal Government bureaucrats and political office holders to facilitate the award of contracts are two recent examples. As Nigeria continues to slide downward on the corruption index, emerging 134th of the 178 countries assessed by Transparency International in October 2010, the challenge of corruption has hit the front line in the nation's governance agenda. This situation has prompted the establishment of Economic and Financial Crimes Commission (EFCC) and the Independent Corrupt Practices and related Offences Commission (ICPC) by the Federal Government of Nigeria to fight the scourge and menace of corruption. The believe in most quarters is that once the challenge of corruption is fixed, all other problems are likely to be resolved easily Indeed, corruption is perceived, at least in the public domain as posing a greater impact on the society and economy including FDI than all other variables. It is therefore important to determine the relative impact of corruption on FDI as against the impact of other factors. This study is an effort in this direction

Evidence of the Influence of Foreign Direct Investment on Economic Growth

The consensus in the literature seems to be that FDI increases growth through productivity and efficiency gains by local firms. The empirical evidence is not unanimous, however. Available evidence for developed countries seems to support the idea that the productivity of domestic firms is positively related to the presence of foreign firms (Gloneram, 1997; Imbriani and Reganeti 1997). The result for Less Developing Countries are not so clear, with some findings reporting positive spillovers (Blomstorm, 1986; Kokko 1994; Blomstorm and Sjoholm, 1999) and others such as Aitken et al. (1997) reporting limited evidence. Still others find no evidence of positive short-run spillover from foreign firms. Some of the reasons adduced for these mixed results are that the envisaged forward and backward linkages may not necessarily be there (Aitken et al 1997) and that arguments of TNCs encouraging increased productivity due to competition may not be true in practice (Aitken et al; 1999). Other reasons include the fact that MNCs tend to locate in high productivity industries and therefore, could force less productive firms to exist (Smarzynska, 2002). Cobham (2001) also postulates the crowding out of domestic firms and possible contraction in total industry size and/or employment. However, crowding out is a more rare event and the benefit of FDI tends to be prevalent (Cotton and Ramachandran, 2001).

Further, the role of FDI in export promotion remains controversial and depends crucially on the motive for such investment (World Bank 1998). The consensus in the literature appears to be that FDI spillovers depend on the host country's capacity to absorb the foreign technology and the type of investment climate (Obiwona, 2004).

The review shows that the debate on the impact of FDI on economic growth is far from being conclusive. The role of FDI seems to be country specific and can be positive, negative or insignificant depending on the economic, institutional and technological conditions in the recipient countries.

Most studies on FDI and growth are cross-country evidences, while the role of FDI in economic growth can be country specific. Further, only a few of the country specific studies actually took conscious note of the endogenous nature of the relationship between FDI and growth in their analyses thereby raising some questions on the robustness of their findings. Finally, the

relationship between FDI and growth is conditional on the macroeconomic dispensation the country in question is passing through. In fact, Zhang (2001) asserts that "the extent to which FDI contributes to growth depends on the economics and social condition or in short, the quality of the environment of the recipient country". In essence, the impact FDI has on the growth of any economy may be country and period specific and such there is the need for country and period specific studies.

Impact of FDI on Economic Growth in Nigeria

There have been some studies on foreign direct investment and economic growth in Nigeria with varying results and submissions. For example, Odozi (1995) reports on the factors affecting FDI flow into Nigeria in both the pre and post Structural Adjustment Programme (SAP) eras and found that the macro policies in place before the SAP were discouraging foreign investors. This policy environment led to the proliferation and growth of parallel markets and sustained capital flight. Ogiogio (1995) reports negative contributions of foreign direct investment to GDP growth in Nigeria for reasons of distortions. Aluko (1961), Brown (1962) and Obinna (1983) report positive linkages between FDI and economic growth in Nigeria. Edosien (1968) discusses the linkage effects of FDI on the Nigerian economy and submits that these have not been considerable and that the broad linkage effects were lower than the Chanery-Watanabe average (Chanery-Watanbe, 1958). Oseghale and Amonkhiehan (1987) found that FDI is positively associated with GDP, concluding that greater inflow of FDI will spell a better economic performance for the country.

Ariyo (1998) studied the investment trend and its impact on Nigeria's economic growth over the years. He found that only private domestic investment consistently contributed to raising GDP growth rate during the period considered (1970, 1995). Furthermore, there is no reliable evidence that all the investment variables included in his analysis have any perceptible influence on economic growth. He therefore suggests the need for an institutional rearrangement that recognizes and protects the interest of major partners in the development of the economy.

Examining the contributions of foreign capital to the prosperity or poverty of LDCs, Oyinlola (1995) conceptualized foreign capital to include foreign loans, direct foreign investments and export earnings. Using Chancery and Stout's two-gap model (Chancery and Stout, 1966), he concluded that FDI has a negative effect on economic development in Nigeria. Further, on the basis of time series data, Ekpo (1995) reports that political regimes, real income per capita, rate of inflation, world interest rate, credit rating and debt services were the key factors explaining the variability of FDI into Nigeria.

Adelegan (2000) explored the seemingly unrelated regression model to examine the impact of FDI on economic growth in Nigeria and found out that the FDI is pro-consumption and pro-import and negatively related to gross domestic investment. Akinlo (2004) found that foreign capital has a small and not statistically significant effect on economic growth in Nigeria.

However, these studies did not control for the fact that most of the FDI was concentrated in the extractive industry. In other words, it could be put that these works assessed the impact of investment in extractive industry (oil and natural resources) on Nigeria's economic growth. On firm level productivity spillover, Ayanwale and Bamire (2001) assessed the influence of FDI on firm level productivity in Nigeria and reported a positive spillover of foreign firms on domestic firms' productivity.

Much of the other empirical work on FDI in Nigeria centered on examination of its nature, determinants and potentials. For example, Odozi (1995) notes that foreign investment in Nigeria was made up of mostly "Greenfield" investment, that is, it is mostly utilized for the establishment of new enterprises and some through the existing enterprises.

RESEARCH METHOD

Model Specification

In this study two econometric models are formulated to achieve our objectives. The first model examines the influence of corruption and other determinants on the FDI inflows into Nigeria. In literature review, domestic market size (proxy by gross domestic product), inflation rate, foreign and exchange rate are some of the determinants of FDI inflows. These variables are incorporated in model one. The second model examines the impact of FDI inflows on economic growth. Other factors such as government expenditure and gross fixed capital formation are added to model two for better results. Government expenditure and gross fixed capital formation are positively related to economic growth (Abu, 2010; Foster and Henrekson 2001; Easterly and Rebelo, 1993). The models are presented as follows:

$$FDI = f(CI, GDP, OPEN, EXC, INF) \quad \text{..... (i)}$$

$$GDP = f(FDI, GOV, GFCF) \quad \text{..... (ii)}$$

The econometric forms of the models are:

$$FDI = \alpha_0 + \alpha_1 CI + \alpha_2 GDP + \alpha_3 OPEN + \alpha_4 EXR + \alpha_5 INF + \varepsilon_t \quad \text{..... (iii)}$$

$GDP = \beta_0 + \beta_1 FDI + \beta_2 GOV + \beta_3 GFCF + \varepsilon_t$ ..... (iv)

Where;

FDI = Foreign Direct Investment Inflow
CI = Corruption Index
GDP = Gross Domestic Product
OPEN = Degree of Openness (proxy by ratio of export to import)
EXC = Foreign Exchange Rate
INF = Inflation Rate
GFCF = Gross Fixed Capital Formation.
GOV = Government Expenditure
α_0; β_0 = Constant terms
α_1 = the parameter estimate of CI
α_2 = the parameter estimate of GDP
α_3 = the parameter estimate of OPEN
α_4 = the parameter estimate of EXC
α_5 = the parameter estimate of INF
β_1 = the parameter estimate of FDI
β_2 = the parameter estimate of GOV
β_3 = the parameter estimate of GFCF
ε_t = the random error term.

In equation (iii), we expect the FDI inflow to be positively related to the host country's market size measure by GDP and openness of the economy to foreign trade (OPEN). However, the coefficients of corruption (CI), inflation (INF) and foreign exchange rate (EXC) are expected to be negative. In equation (iv), the coefficients of government (GOV), foreign direct investment inflow (FDI) and gross fixed capital formation (GFCF) are expected to be positive.

Sources of data for the study

The data used in this study are annual time-series data on the variables covering thirty one year period 1980-2010. For model one, FDI inflow is dependent variable, while Corruption Index (CI), Degree of Openness (OPEN), Foreign Exchange Rate (EXR), Inflation Rate (INF). In model two, Foreign Direct Investment inflow (FDI), Government Expenditure (GOV) and Gross fixed Capital Formation (GCF) are the explanatory variables while GDP is dependent variable. The major sources of these data are the publications of Central Bank of Nigeria annual statistical Bulletin, The Bullion and the Economic and Financial Review, Seminar Papers, Journals, and the Internet.

Estimation Technique

The estimation techniques employed for this study are unit root test, granger causality test and ordinary least squares estimation technique.

The unit root test is a test of stationarity (i.e. order of integration of individual series used in study). This test is justified by Gujarati (2006) that "if we are dealing with time series data, we must make sure that the individual time series are either stationarity or that they are co integrated. If this is not the case, we may open to the charge of engaging in spurious (or nonsense) regression analysis." The most popular unit root tests among econometricians are Augmented Dickey-Fuller (ADF) developed by Dickey and Fuller (1979, 1981) and Phillip Perron due to Phillips (1987) and Phillips and Perron (1988). In this study, the Dickey and Fuller (1979, 1981) also known as Augmented Dickey-Fuller unit root test was used test stationarity of all the series. Augmented Dickey-Fuller test relies on rejecting a null hypothesis of unit root (the series are non-stationary) in favour of alternative hypothesis of stationarity.

The co-integration test describes the long-run or equilibrium relationship between the series under consideration, particularly if the series are in the same order of integration. The assumption of co-integration is that if in the long run two or more series move closely together, even though the series themselves are trended, the difference between is constant (Chimobi, 2010). A lack of co-integration means that the series have no long relationship. The objective of co-integration is achieved in this study using Johansen (1988); and, Johansen and Juselius (1990) test for co-integration of the variables.

The granger causality test determines the causal relationship or the direction of causality between series. In this study, granger causality is deployed to determine the causal relationship or confirm the direction of causality between FDI and corruption. This test is necessary because the direction of causation between FDI and corruption is not certain (i.e. inconclusive). While many economic theorists believe that corruption does not significantly granger causes FDI (i.e. existence of inverse relationship), others opine that corruption significantly granger causes FDI. This test was also conducted on the other determinants of FDI inflows under consideration.

The ordinary least square technique is employed to determine the influence of corruption as well as other determinants on FDI inflows. The OLS explains the effects of the explanatory variables on the dependent variable. The technique was used for estimating the equation (iii) and (iv) specified. This method is popularly used because of its simplicity and strong theoretical properties such as linearity, unbiased and minimum variance among a class of unbiased estimators (Gujarati, 2006).

EMPIRICAL RESULTS

Unit Root Test

This involves testing for the stationarity of the individual variables using the Augmented Dickey Fuller (ADF) test to find the existence of unit root in each of the time

series. The result of the ADF test are reported in Tables 4.1 (levels) and 4.2 (first difference).

All the variables were not found stationary in levels. This can be seen by comparing the observed values (in absolute terms) of the ADF test statistics with the critical values (also in absolute terms) of the test statistics at the 1%, 5% and 10% level of significance. Result from table 4.1 provides strong evidence of non stationarity. Therefore, the null hypothesis is accepted and it is sufficient to conclude that there is a presence of unit root in the variables at levels.

As a result of the above result, all the variables were differenced once and the ADF test was conducted on them as shown in table 4.2. The coefficients compared with the critical values (1%, 5% and 10%) reveals that all the variables were stationary at first difference and on the basis of this, the null hypothesis of non-stationary is rejected and it is safe to conclude that the variables are stationary. This implies that the variables are integrated of order one i.e 1(1).

Co-integration Test Result and Analysis

The results of the co-integration (that is the existence of a long term linear relation) is presented in Table 4.3 (Trace Staistics) and 4.4 (Maximum Eigenvalue) using methodology proposed by Johansen and Juselius (1990). In the co integration tables, both trace statistic and maximum eigenvalue statistic indicate co integration at the 5 percent level of significance, suggesting that there is co-integrating (or long run) relationship between FDI, corruption, gross domestic product, openness, exchange rate and inflation rate. Specifically, the result of the co-integration test suggests that foreign direct investment inflow has equilibrium condition with corruption, market size, openness of the economy, exchange rate and inflation rate which keep them in proportion to each other in the long run. This evidence of co-integration among the variables rules out spurious correlations and applies that one direction of influence can be established among the variables. It is important to note that the existence of co-integration vectors among a group of variables may not imply that there is causal influence between pairs of variables in the model of co-integration test.

Granger Causality Test Analysis

Causality does not necessarily imply correlation in the sense that the result obtained may not explain whether the relationship is positive or negative. However, FDI and corruption, as widely suggested by many scholars in the literature review are known to relate both negatively and positively, in other words, the dimension of the relationship is unclear. In any case the result shown in table 4.5 reveals the direction of causality between FDI inflow and corruption at lag two (2). The results show that there is one-way causality relationship flowing from corruption to FDI inflow into Nigeria thus, it could be construed that corruption causes FDI inflow.

Following the result in table 4.5, the null hypothesis that GDP does not Granger Cause FDI inflow is rejected and it is safe to conclude that uni-directional causality run from GDP to FDI Inflow at lag two (2).

In the same result shown in table 4.5, the null hypothesis that OPEN does not Granger cause FDI inflow is rejected, but in the reverse that FDI inflow in-turn Granger cause OPEN. The result suggests a unidirectional causality from FDI inflow to OPEN at lag 2.

Also, the results shown in table 4.5 affirm the null hypothesis that INF and EXC do not Granger cause FDI inflow is accepted. The result suggests no directional causality from both INF and EXC to FDI inflow at lag 2.

Ordinary Least Square Results

The regression results for model one shows that the independent variables explained approximately 79 percent variations in foreign direct investment inflows in Nigeria. The value of the F-statistic at 11.318 shows that the equation has a good fit, that is, the explanatory variables are good explainer of changes in FDI inflow into Nigeria. The Durbin Watson statistic of 2.258 illustrates the absence of autocorrelation among the variables.

The corruption index was found to be negative and has the correct sign. This means that, a 1 point increase in the corruption level in the host country leads to a reduction in the FDI inflow approximately by 1587.591 percent. This is consistent with the findings of Al-Sadiq (2009); and Mohsin and Leon (2009) who discovered that the corruption level in the host country has an adverse effects on FDI inflows. This implies further that corruption Granger cause the inflow of FDI. Another discovery from the estimation is that exchange rate is significant in explaining changes in FDI. A1 percent depreciation in exchange rate causes FDI to increase by approximately 518.84 percent. This revelation is in line with Masayuki and Ivohasina (2005) that exchange rate depreciation may encourage the inflow of foreign direct investment to the host country. The estimation also reveals that inflation has a significant positive effect on foreign direct investment. A 1 percentage increase in inflation leads to 672.12 percentage increase in FDI. The positive impact of inflation on FDI inflow reflects the strand of inconclusive evidences on the direction of relationship between the FDI inflow and the host country consumer price index. This also reflects the situation in the Nigeria's real and manufacturing sector that has continued to attract foreign investment regardless of high cost of goods and services. However, the results show that openness of the economy and market size is statistically insignificant but positively related to foreign direct

investment. The result of the market size, for instance, contradict the finding of Abu (2010) who indicated that development in market size attract more foreign direct investment. This may not be unconnected with various socio-economic crises in Nigeria which prevent smooth economic activities. The result of openness is, however, in line with work of Abu (2009) who discovered a statistically insignificant relationship between openness of the economy and foreign direct investment in Nigeria.

In model two, the estimation results reveal that the explanatory variables jointly account for approximately 75.60 percentage changes in economic growth. The adjusted co-efficient of determination (R^{-2}) shows that the equation has a good fit with 0.713 percent of the analysis. The Durbin-Watson statistic of 1.90 which is significantly below the bench mark of 2.50 (Koutsoyiannis, 2005) illustrates the absence of auto correlation in the model specification. The F statistic test is statistically significant, thus showing that the explanatory variables are statistically significant. The estimation results show that foreign direct investment inflow and gross fixed capital formation are statistically and economically significant. For example, a one percentage increase in foreign direct investment inflow to the host country raises gross domestic product by approximately 3.42 percentages. This is consistent with work of Borensztein, De Gregoria and Lee (1998), Ayanwale and Bamire (2004), Akinlo (2004), Ayanwale (2007), Adegbite and Ayadi (2010), and Omankhanlen (2011) who revealed that higher inflow of foreign direct investment lead to increase in gross domestic product and raises economic growth. Moreover, a one percent increases in gross fixed capital formation increase economic growth. This is in line with the classical economic theory that savings induce investment and further promote economic growth. Finally, it is shown that government expenditure is statistically insignificant and negatively related to economic growth. It is not significant in explaining changes in economic growth. For instance, one percentage increase in government causes economic growth to decline by 19.939 percentage. This is not surprising as most public funds in Nigeria which are meant for the development of the economy are strategically diverted by government officials and have not been properly utilized for the purpose they are allocated.

Test of Hypotheses

This section focuses on the test of hypotheses formulated in the study. Along with the others findings, the findings here will further confirm the effects of corruption on inflow of foreign direct investment in Nigeria. It will also confirm the relationship between foreign direct investment and economic growth. These shall form the pointer upon which our conclusion and recommendations will be based. Here, the F-statistics and f table values are required.

Hypothesis 1

Recall: Ho: $\alpha 1 = 0$: There is no significant relationship between the level of Corruption and the level of FDI inflow.

H1: $\alpha\ 1 \neq 0$: There is significant relationship between the level of Corruption and the level of FDI inflow.

Decision: Accept H0 if $F_{0.05}$ > F-statistics and

Reject Ho and accept H1 if $F_{0.05}$ < F-statistics

Where F0.05 (5/15) = 11.3188, and F Statistics = 1.395

Hence, 11.3188> 1.395

Therefore, we reject Ho and accept Hi implying that there is a significant relationship between the level of Corruption and inflow of Foreign Direct Investment into the Nigeria within the period of 1990-2010.

Hypothesis II

Recall: H0: $\beta 1 = 0$: There is no significant relationship between the level of economic growth and the level of FDI inflow into Nigeria.

H1: $\beta 1 \neq 0$: There is significant relationship between the level of economic growth and the level of FDI inflow into Nigeria.

Decision: Accept Ho if F0.05 > F Statistics

Reject H0 and accept H1 if F0.05 < F Statistics

F0.05 (3/17) = 3.20

F Statistics = 17.566 and /F/ = 3.20

Hence, 17.566 > 3.20

From this, we accept H1 implying that there is significant relationship between the level of economic growth and the level of FDI inflow into Nigeria (1990-2010).

CONCLUSION

The objective of this study was to find out the existence (if any) of a relationship between FDI inflow, corruption and economic growth in Nigeria and direction of such a relationship. The methodology employed in this study is Granger causality test and Ordinary Least Square Method. We used gross domestic product (GDP) as proxy for economic growth, total foreign direct figure as proxy for FDI inflow and corruption index as proxy for corruption. The scope of the study spanned from 1990 to 2010. Two hypotheses were tested. The ADF results show that all the variables were stationary at first difference. The result of Granger causality tests shows that corruption Granger cause FDI inflow. Also, there is uni-directional causality from GDP to FDI inflow. This confirms the existing arguments that the economic development of the host country is a relevant determinant of inflow of FDI. The empirical analysis reveals the existence of a long-run relationship between FDI inflow, reduction in level of corruption, economic openness, exchange rate depreciation and stability of prices. The finding shows that there is a significant relationship between the level of Corruption and the Inflow of Foreign

Direct Investment into Nigeria within the period of 1990-2010. The impact of corruption on FDI inflow is negative from the OLS result. The policy implication of this is that Nigeria can only attract a large volume of FDI inflow if and only if corruption at all levels of governance is drastically reduced and checkmated. Apart from this, exchange rate volatility and rising cost of goods and services due to economic distortion must be controlled. Finally the finding support previous results in the literature of the relationship between FDI inflow and economic growth.

RECOMMENDATIONS

The following recommendations are suggested for the reduction of corruption in Nigeria to improve the inward flow of foreign direct investment and promote the economic growth of the nation.

i. The activities of the anti-corruption agencies in Nigeria such as the Economic and Financial Crimes Commission (EFCC) and the Independent Corrupt Practices and Related Offences Commission (ICPC) should be strengthened.

ii. The rule of law must be upheld to instill sanity in the administration of justice. Equal treatment of corrupt officials is a necessity. There should be no exceptions to the rules as the law is no respecter of persons.

iii. Nigerians should put in leadership positions honest individuals who would serve as role models to minimize the negative consequences of corruption with its negative impact on inward FDI.

iv. Nigeria's legal and judicial system should be reviewed and restructured to handle swiftly the cases of people that are engaged in corrupt practices. There is a need for the introduction of measures that will make both the means and rewards of corruption unprofitable for the perpetrators by applying strict sanctions.

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.

Appendix 1

Table 4.1:ADF Test at Levels

Variable	ADF (Intercept)	ADF (Intercept and Trend)
CI	-1.380 (-3.020)**	-2.694 (-3.658)**
GDP	1.982 (-3.020)**	-1.527 (-3.658)**
OPEN	-4.153(-3.020)**	-4.178 (-3.658)**
EXC	-0.937 (-3.020)**	-1.457 (-3.658)**
INF	-1.714 (-3.020)**	-2.472 (-3.658)**
FDI	-0.240 (-3.029)**	-0.849 (-3.673)**
GOV	-3.457 (-3.020)**	-5.734 (-3.658)**
GFCF	-0.765 (-3.040)**	-6.077 (-3.268)**

Note*:* Note: *and ** denotes significance at 1% and 5% level, respectively. Figures within parenthesis indicate critical values. Mackinnon (1991) critical value for rejection of hypothesis of hypothesis of unit must applied.
Source: Author's Estimation using Eviews 7.0

Table 4.2: ADF (Stationarity) at First Difference

Variable	ADF (Intercept)	ADF (Intercept and Trend)
CI	-4.767 (-3.029)**	-4.670 (-3.673)**
GDP	-2.866 (-2.655)*	-3.809 (-3.277)*
OPEN	-6.339 (-3.029)**	-6-151 (-3.673)**
EXC	-4.099 (-3.029)**	-4.035 (-3.673)**
INF	-5.242 (-3.081)**	-8.839 (-3.759)**
FDI	-7.924 (-3.029)**	-3.996 (-3.690)**
GOV	-5.686 (-3.040)**	-5.505 (-3.690)**
GFCF	-6.525 (-3.040)**	-6.302 (-3.690)**

Note: *and * denotes significance at 5% an 1% level, respectively. Figures within parenthesis indicate critical values. Mackinnon (1991) critical value for rejection of hypothesis of hypothesis of unit must applied.
Source: Author's Estimation using Eviews 7.0

Table 4.3 Unrestricted Co-integration Rank Test (Trace)
Date: 07/27/11 Time: 17:22
Sample (adjusted): 1992 2010
Included observations: 19 after adjustments
Trend assumption: Linear deterministic trend
Series: FDI CI GDP OPEN EXC INF
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.994737	235.7591	95.75366	0.0000
At most 1 *	0.951976	136.0648	69.81889	0.0000
At most 2 *	0.891674	78.37953	47.85613	0.0000
At most 3 *	0.669477	36.14998	29.79707	0.0081
At most 4	0.511346	15.11545	15.49471	0.0570
At most 5	0.076376	1.509545	3.841466	0.2192

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 4.4. Unrestricted Co-integration Rank Test (Maximum Eigenvalue)
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.994737	99.69434	40.07757	0.0000
At most 1 *	0.951976	57.68522	33.87687	0.0000
At most 2 *	0.891674	42.22955	27.58434	0.0003
At most 3	0.669477	21.03453	21.13162	0.0516
At most 4	0.511346	13.60591	14.26460	0.0633
At most 5	0.076376	1.509545	3.841466	0.2192

Table: 4.5: Granger Causality Test
Pairwise Granger Causality Tests
Date: 07/27/11 Time: 17:33
Sample: 1990 2010
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
CI does not Granger Cause FDI	19	3.17235	0.0731
FDI does not Granger Cause CI		0.35420	0.7078
GDP does not Granger Cause FDI	19	3.59647	0.0549
FDI does not Granger Cause GDP		1.48643	0.2598
OPEN does not Granger Cause FDI	19	1.37854	0.2841
FDI does not Granger Cause OPEN		3.58892	0.0552
EXC does not Granger Cause FDI	19	1.06164	0.3722
FDI does not Granger Cause EXC		0.38013	0.6906
INF does not Granger Cause FDI	19	1.35076	0.2908
FDI does not Granger Cause INF		1.36650	0.2870
GDP does not Granger Cause CI	19	1.34402	0.2925
CI does not Granger Cause GDP		1.31741	0.2991
OPEN does not Granger Cause CI	19	1.51923	0.2529
CI does not Granger Cause OPEN		0.85363	0.4469
EXC does not Granger Cause CI	19	1.57626	0.2413
CI does not Granger Cause EXC		2.93881	0.0860
INF does not Granger Cause CI	19	1.77421	0.2057
CI does not Granger Cause INF		5.85387	0.0142
OPEN does not Granger Cause GDP	19	0.23129	0.7965
GDP does not Granger Cause OPEN		1.57808	0.2410
EXC does not Granger Cause GDP	19	12.9858	0.0006
GDP does not Granger Cause EXC		0.01832	0.9819
INF does not Granger Cause GDP	19	0.28129	0.7590
GDP does not Granger Cause INF		1.08417	0.3650
EXC does not Granger Cause OPEN	19	0.13170	0.8777
OPEN does not Granger Cause EXC		0.10376	0.9021
INF does not Granger Cause OPEN	19	2.57728	0.1114
OPEN does not Granger Cause INF		1.66431	0.2247
INF does not Granger Cause EXC	19	2.94264	0.0857
EXC does not Granger Cause INF		1.62371	0.2322

REGRESSION RESULT

EQ (1) Modeling FDI by OLS – The Sample is 1 to 21
Dependent Variable: D(FDI)
Method: Least Squares
Date: 07/28/11 Time: 22:03
Sample (adjusted): 1991 2010
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4454.485	5441.654	0.818590	0.4267
D(CI)	-1587.591	10664.07	-0.148873	0.8838
D(GDP)	0.084885	0.151903	0.558808	0.5851
D(OPEN)	275.2833	270.4500	1.017871	0.3260
D(EXC)	-518.8454	240.2789	-2.159346	0.0487
D(INF)	672.1213	279.8281	2.401907	0.0308

R-squared	0.506077	Mean dependent var	3211.745
Adjusted R-squared	0.329675	S.D. dependent var	20165.45
S.E. of regression	16510.13	Akaike info criterion	22.50466
Sum squared resid	3.82E+09	Schwarz criterion	22.80338
Log likelihood	-219.0466	Hannan-Quinn criter.	22.56297
F-statistic	2.868894	Durbin-Watson stat	2.614732
Prob(F-statistic)	0.054820		

FDI = 4454.485 -1587.51CI +0.084GDP + 275.28OPEN – 518.84EXC + 672.12INF
EQ (2) Modeling GDP by OLS – The Sample is 1 to 21
Dependent Variable: GDP
Method: Least Squares
Date: 07/28/11 Time: 21:51
Sample: 1990 2010
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	226797.8	34278.10	6.616405	0.0000
FDI	3.425115	0.907750	3.773191	0.0015
GOV	-16.93977	12.52057	-1.352955	0.1938
GFCF	0.370453	0.130162	2.846103	0.0112

R-squared	0.756091	Mean dependent var	420220.3
Adjusted R-squared	0.713048	S.D. dependent var	161300.4
S.E. of regression	86405.20	Akaike info criterion	25.74113
Sum squared resid	1.27E+11	Schwarz criterion	25.94008
Log likelihood	-266.2818	Hannan-Quinn criter.	25.78431
F-statistic	17.56606	Durbin-Watson stat	1.904085
Prob(F-statistic)	0.000019		

GDP = 226797.8 + 3.42FDI – 16.93GOV + 0.37GFCF

Appendix 2

Data for Regression Analysis

Year	CI	INF	FDI	GDP	GOV	EXC	GFCF	OPEN
1990	0	7.5	10,450.20	267550	60.3	8.0378	30626.8	57.23
1991	0	12.7	5,610.20	265379.1	66.7	9.9095	35423.9	66.64
1992	0	44.81	11,730.70	271365.5	93.9	17.2984	58640.3	65.03
1993	0	57.17	42,624.90	274833.3	136.7	22.0511	80948.1	55.86
1994	0.99	57.03	17,825.50	275450.6	156.8	21.8861	85021.9	40.8
1995	0.63	72.81	55,999.30	281407.4	307.2	21.8861	114476	88.16
1996	0.69	29.29	5,672.90	293745.4	283	21.8861	172106	69.24
1997	1.76	10.67	10,004.00	302022.5	428.2	21.8861	205553	74.5
1998	1.9	7.86	32,434.50	310890.1	487.1	21.8861	192984	58.4
1999	1.6	6.62	4,035.50	312183.5	947.7	92.6934	175736	61.91
2000	1.2	6.94	16,453.60	329178.7	7019.1	102.1052	268895	62.5
2001	1	18.87	4,937.00	356994.3	1019.1	111.9433	371898	62.5
2002	1.6	12.89	8,988.50	433203.5	1188.7	120.9702	438115	55.57
2003	1.4	14.03	13,531.20	477533	1225.9	129.3565	429230	79.94
2004	1.6	15.01	20,064.40	527576	1384	133.5004	456970	80
2005	1.9	17.85	26,083.70	561931.4	17443.2	131.6619	1780040	60.5
2006	2.2	8.24	41,734.00	595821.4	1942.3	128.6516	227270	45.4
2007	2.2	5.38	56,854.73	634251.1	6923.17	117.968	821426	61.96
2008	2.7	11.6	63,436.91	674889	8769.56	130.75	942912	55.95
2009	2.5	8.49	69,726.10	654570.1	5878.34	124.36	663869	54.43
2010	2.3	12.89	74,685.10	723849.9	7190.36	130.6498	809402	57.44

Source: CBN-Statistical Bulletin 2009 and various issues