Determinants of Foreign Direct Investment (FDI) Inflows to Nigeria (1970-2010)

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Abstract: *This paper summarizes the findings of causality and long-term relationship between Foreign Direct Investment (FDI), economic growth and other socio-political determinants. Although a considerable literature gives the evidence of relationship between FDI and economic growth. There is a need for a detailed examination of socio-political determinants of FDI. The paper considers economic growth, exchange rate, and level of interest rates, unemployment, and political instability as determinants of the level of FDI inflows for Nigeria over the period 1970 to 2010. Almost all variables are found to have the theoretically expected signs with two-way causality relationship. The present study also estimates an error correction model by ordinary least squares, based on cointegrating VAR (2).*

Keywords: *causality, co-integration, Determinant, Foreign Direct Investment, Long term*

I. Introduction

The role of FDI as an engine of growth and development in developing nations cannot be overemphasized: it create employment, act as an avenue of technology transfer, skills, managerial skills, facilitate access to the international market and product diversity to name but a few. Nigeria in its quest to attract foreign investments have engaged in several reforms and policies ; prominent of which are the industrial policy of 1989, the enactment of Nigerian investment and promotion council (NIPC) in the early 1990's, deregulation of the economy, signing of bilateral investment treaty (BIT's) which took place in the late 1990's. with the coming of the present democratic dispensation Nigeria witnessed yet another economic reforms aimed at complementing the existing reforms earlier mentioned; these reforms and policies led to the establishment of economic and financial crimes commission (EFCC), independent corrupt practice and related commission (ICPC) Bureau of Public Enterprises (BPE) and host of other latent reforms geared to woo investors locally and internationally.

Despite all these giant effort by successive administration Nigeria during the period under study and before the indices of FDI remain abysmal. Though several literature abound on the subject under discussion, identifying various variables by different authors in different studies such as: size of the market of the host country, infrastructure, openness of the market, economic instability, exchange rate instability all have negative effects on FDI as opined by [1].

[2] pointed out that domestic investment, openness and indigenization policy are all very important determinant of FDI in Nigeria; while [3] is of the opinion that high bank lending rate that was witnessed during the deregulation era of late 1980's has contributed significantly in inducing investment inflows. The provision of credit to investor in form of subsidized loans, loans guarantees, and export credit will definitely stimulate immediate cash flow and liquidity.

In the light of above statement; this study intends to identify the determinants, test for their significance, causality and long term relationship that might exist between FDI and economic growth and socio-political determinants from 1970-2010 to Nigeria.

1.1 Determinant of FDI Flows

The unpredictability of autonomous FDI flows, in both scale and direction, has generated a substantial research effort to identify their major determinants. An extensive literature based generally on three approaches - aggregate econometric analysis, survey appraisal of foreign investors' opinion, and econometric study at the industry level - has failed to arrive at a consensus. This can be partly attributed to the lack of reliable data, particularly at the sectorial level, and to the fact that most empirical work has analysed FDI determinants by pooling of countries that may be structurally diverse. The remainder of this paper is mainly concerned with examining the factors influencing the destination of the investment: host-country determinants, rather than industry-specific factors.

1.1.1 Size of the market

Econometric studies comparing a cross section of countries indicate a well-established correlation between FDI and the size of the market (proxied by the size of GDP) as well as some of its characteristics (for example, average income levels and growth rates). Some studies found GDP growth rate to be a significant explanatory variable, while GDP was not, probably indicating that where the current size of national income is very small, increments may have less relevance to FDI decisions than growth performance, as an indicator of market potential.

There is little doubt that the size of China's market explains, in large part, the massive FDI flows it has attracted since the early 1980s. Within China, FDI has been concentrated (over 90%) in the coastal areas. Provincial GNP, reflecting economic development and potential demand, has also been indicated as the major determinant of this concentration [4]

For sub-Saharan Africa as a whole, [5] identify GDP growth as a major factor. Only three SSA low-income countries are amongst the nine main recipients of FDI flows in recent years, and of these only Nigeria is close to being classified as a large market (according to UNCTAD's benchmark of $36bn GNP). Angola and Ghana (with GNP of $8.9bn and $5.5bn in 1995 respectively), received larger proportional FDI flows in 1995 than Nigeria, indicating that small market size need not be a constraint in the case of resource-endowed, export-oriented economies. In fact, extractive industries in the low-income African countries continue to attract foreign investors as they have always done.

In contrast, India, Pakistan and, to a certain extent, Bangladesh, have large markets but received proportionately relatively small (below 1%) FDI flows in 1986 95. Some analysts interpret this as evidence of high potential for increased FDI flows in the. Future; others stress that constraints are still restraining the channeling of foreign investment to these countries.
For the majority of low-income countries which fail to attract large FDI flows, their small domestic markets are often cited as the main deterrent. Given other economic and political shortcomings, most investors are doubtful about the value of installing a factory unless they can achieve a `critical mass' for their products. Regional integration is often perceived as a positive means of compensating for small national markets. There is currently no clear evidence of the degree of this influence on FDI flows. Some investors expect positive spillover effects from South Africa and are generally optimistic about an East African free trade area, but the benefits may well be concentrated in the economically stronger states.

1.1.2. Openness
Whilst access to specific markets - judged by their size and growth - is important, domestic market factors are predictably much less relevant in export-oriented foreign firms. A range of surveys suggests a widespread perception that "open" economies encourage more foreign investment. One indicator of openness is the relative size of the export sector. [6] Study indicates that exports, particularly manufacturing exports, are a significant determinant of FDI flows and that tests show that there is strong evidence that exports precede FDI flows. China, in particular, has attracted much foreign investment into the export sector. In Bangladesh, on the other hand, foreign investors have been attracted to the manufacturing sector by its lack of quota for textiles and clothing exports to the European Union and US markets. Garment exports, for example, rose from virtually nil in the 1970s to over one-half of its export earnings by the early 1990s. In contrast, most low-income Sub-Saharan African economies have remained more inward-oriented.

1.1.3. Labour costs and productivity
Empirical research has also found relative labour costs to be statistically significant, particularly for foreign investment in labour-intensive industries and for export- oriented subsidiaries. The decision to invest in China, for example, has been heavily influenced by the prevailing low wage rate. The rapid growth in FDI to Vietnam has also been attributed primarily to the availability of low-cost labour. In India, in contrast, labour market rigidities and relatively high wages in the formal sector have been reported as deterring any significant inflows into the export sector in particular.

However, when the cost of labour is relatively insignificant (when wage rates vary little from country to country), the skills of the labour force are expected to have an impact on decisions about FDI location. Productivity levels in sub-Saharan Africa are generally lower than in low-income Asian countries, and attempts to redress the skill shortage by importing foreign workers have usually been frustrated by restrictions and delays in obtaining work permits. The lack of engineers and technical staff in these countries is reported as holding back potential foreign investment, especially in manufacturing; it lessens the attractiveness of investing in productive sectors.

1.1.4. Political Risk
The ranking of political risk among FDI determinants remains somewhat unclear. Where the host country possesses abundant natural resources, no further incentive may be required, as is seen in politically

unstable countries such as Nigeria and Angola, where high returns in the extractive industries seem to compensate for political instability. In general, so long as the foreign company is confident of being able to operate profitably without undue risk to its capital and personnel, it will continue to invest. Large mining companies, for example, overcome some of the political risks by investing in their own infrastructure maintenance and their own security forces. Moreover, these companies are limited neither by small local markets nor by exchange-rate risks since they tend to sell almost exclusively on the international market at hard currency prices.

Specific proxy variables (e.g. number of strikes and riots, work days lost, etc.) have proved significant in some studies; but these quantitative estimates can capture only some aspects of the qualitative nature of political risk. Surveys carried out in South Asia and sub-Saharan Africa appear to indicate that political instability, expressed in terms of crime level, riots, labour disputes and corruption, is an important factor restraining substantial foreign investment.

1.1.5. Infrastructure

Infrastructure covers many dimensions, ranging from roads, ports, railways and telecommunication systems to institutional development (e.g. accounting, legal services, etc.). Studies in China reveal the extent of transport facilities and the proximity to major ports as having a significant positive effect on the location of FDI within the country. Poor infrastructure can be seen, however, as both an obstacle and an opportunity for foreign investment. For the majority of low-income countries, it is often cited as one of the major constraints. But foreign investors also point to the potential for attracting significant FDI if host governments permit more substantial foreign participation in the infrastructure sector. Recent evidence seems to indicate that, although telecommunications and airlines have attracted FDI flows (e.g. to India and Pakistan), other more basic infrastructure such as road-building remains unattractive, reflecting both the low returns and high political risks of such investments.

Surveys in sub-Saharan Africa indicate that poor accounting standards, inadequate disclosure and weak enforcement of legal obligations have damaged the credibility of financial institutions to the extent of deterring foreign investors. Bad roads, delays in shipments of goods at ports and unreliable means of communication have added to these disincentives.

1.1.6. Incentives and operating conditions

Most of the empirical evidence supports the notion that specific incentives such as lower taxes have no major impact on FDI, particularly when they are seen as compensation for continuing comparative disadvantages. On the other hand, removing restrictions and providing good business operating conditions are generally believed to have a positive effect. In China, the "open-door" policy and enhanced incentives for investing in the special economic zones contributed to the initial influx of FDI. Further incentives, such as the granting of equal treatment to foreign investors in relation to local counterparts and the opening up of new markets (e.g. air transport, retailing, banking), have been reported as important factors in encouraging FDI flows in recent years.

The Indian Government has recently relaxed most of the regulations regarding foreign investment. This is seen as contributing to the increased FDI flows in the last couple of years. However, the lack of transparency in investment approval procedures and an extensive bureaucratic system are still deterring foreign investors; hence the relatively low FDI/GNP ratios. In 1991, Bangladesh and Pakistan implemented reforms allowing foreign investors to operate with 100% foreign ownership but still failed to attract significant flows (as a proportion of GNP) because of political instability and an over-extended bureaucracy. Nigeria, in contrast, continues to attract foreign investment as an oil-exporting country despite its erratic and relatively inhospitable policies. With regard to the remaining low-income countries with small FDI inflows, surveys indicate that the lack of a clear-cut policy with respect to foreign investment and excessive delays in approval procedures are amongst the most important deterrents. Although a number of African countries set up `one-stop investment shops' during the 1980s in order to simplify approval procedures, the increased workload created bottlenecks.

1.1.7. Privatization

Though privatization has attracted some foreign investment flows in recent years (e.g. Nigeria in 1993 and Ghana in 1995), progress is still slow in the majority of low- income countries, partly because the divestment of state assets is a highly political issue. In India, for example, organized labour has fiercely resisted privatization or other moves which threaten existing jobs and workers' rights. At a regional level, 1994 figures show 15% of FDI flows to Latin America as derived from privatization, but only 8.8% in sub-Saharan Africa and 1.1% in South Asia. A number of structural problems are constraining the process of privatization. Financial markets in most low- income countries are slow to become competitive; they are characterized by inefficiencies, lack of depth and transparency and the absence of regulatory procedures. They continue to be dominated by

government activity and are often protected from competition. Existing stock markets are thin and illiquid and securitized debt is virtually non-existent. An under-developed financial sector of this type inhibits privatization and discourages foreign investors.

1.2 Aim and Objectives of the Study

The study is aimed at determining the foreign direct investment (FDI) inflows to Nigeria from 1970-2010, with a view to achieve the following specific objectives to:

(i) Investigate the determinants of Foreign Direct Investments to Nigeria.

(ii) Determine whether there is long run equilibrium effects among the determinants

(iii) If long run equilibrium effects exist then error correction of the model is conducted

II. Review of Relevant Literature and Theoretical Background

Several literatures on the subject opined that the market sizes of the host country, inflation, exchange rates are important determinants of FDI. [7] Pointed out that openness of the economy and inflation though positively related to FDI but not statistically significant. Another factor that induces inflow of FDI is exchange rate [8]. Political regime, real income per capita, rate of inflation world rate interest Credit rating and debt are important variable of FDI inflows to [9].

In yet another development [10] argued that despite government incentive to woo investors, many investors are still divided minded to Nigeria. Masayuki and [8] pointed out that the price of land was the significant determinant of FDI inflows into Japan. [11] in a study an empirical investigation of factor determining FDI to Nigeria revealed that endowment of natural resources, trade intensity, macroeconomic risk, factors like inflation and exchange rate as significant determinant of FDI flow to Nigeria, long run market size is not a significant factor for attracting FDI to Nigeria contradicting existing literature.

[12] Pointed out that political instability; macroeconomic instability and availability of natural resources have important implication on FDI inflow to Nigeria, which is in agreement with the findings of [1] and [11]. Policy coordination macroeconomic and political environment is an important factor in attracting significant level of foreign investment. However, [13] opined that the host country's FDI make credit available to investors in a form of subsidized loans, loan guarantees as well as guaranteed export credits. He noted that these credits are provided directly to foreign investors for their operations particularly to defray some inevitable costs which invariably have an immediate impact on cash flow and liquidity.

[14] Maintained that it is not profitability of investment today that attracts investors to invest, but how long will the profit remain fairly stable overtime. Whenever the socio-political and economic environment is highly volatile, an investor is better off exercising his option to wait. In the same vein, he might decide to invest on short cycle projects and can be easily undone. He also asserted that while the maintenance of the macroeconomic stability, avoidance of over-valued exchange rates and export orientation are critical for the resurgence of investment they are necessary but not sufficient conditions. [15] Observed that public investment directly influences private investment. As such the public (government) should invest in infrastructures which give an enabling environment for private investors; consequently it will help in attracting foreign direct investment to Nigeria. Having reviewed relevant literatures on the subject; it worth mentioning that of the variables considered as an important determinant of FDI are at one point negated or supported by other studies. It's hoped that this findings of this study would negate, support or come up with new ideas entirely different.

2.1 Theoretical Framework

Theoretically, a time series is a collection of a random variable $\{X_t\}$. If such a collection of the random variable is ordered in time, it is called a Stochastic Process. Thus, without any loss of generality, we may consider that a time series is a realization of a stochastic process.

A type of stochastic process that has received a great deal of attention and scrutiny by time series analyst is the so called stationary stochastic process. Broadly speaking, a stochastic process is said to be stationary if its mean and variance are constant over time and the value of the covariance between the time periods depends only on the distance or lag between the two time periods and not the actual time at which the covariance is computed.

Let Y_t be a stochastic time series, the properties of the stationary stochastic process are:

1. Mean

$$E\,(Y_t)\,=\,\mu \qquad\qquad (2.1.1)$$

2. Variance

$$Var\,(Yt)\,=\,E(Yt-\mu)\,=\,\sigma^2 \qquad\qquad (2.1.2)$$

3. Covariance

$\Upsilon_k = E[(Y_t-\mu)\,(Y_t+k-\mu)]$ Where Υ_k is the covariance (or auto covariance) at lag k, is the covariance between Y_t and Y_{t+k}. If a time series is stationary, it means variance and auto covariance(at various lags) remain the same no matter at what point we measure them; that is they are time invariant. Such a time series will tend to

return to its mean (called mean reversion) and fluctuations around this mean (measured by variance) will have broadly constant amplitude if a time series is not stationary in the sense just defined is said to be non stationary time series. A non stationary time series will have a varying mean or a time varying variance or both.

2.2 Unit Root Test.
There are objective test that may be conducted to determine whether a series is stationary. The series could be non-stationary due to random walk, drift, or trend. One way to test this is to evaluate a regression that test a mean, a lagged term, and a deterministic term are as follows:

$$Y_t = \beta_1 + \beta_2 t + \beta_3 Y_t - 1 + \mu_t \qquad (2.2.0)$$

By taking the first difference of Y_t, one finds that:

$$\nabla Y_t = \beta_1 + \beta_2 t + (1 - \rho)Y_t - 1 + \mu_t \qquad (2.2.1)$$

This model forms the basis of the Dickey-fuller test. The test parameter distribution depends on the sample size and which terms are in the model. Therefore, application of Dickey-fuller test depends on the regression context in which the lagged dependent variable is tested. These model contexts are those of purely random walk, random walk plus drift and combination of deterministic trend, random walk and drift. To detect the stochastic form of non-stationary, the Dickey-fuller test entails a regression of a series on first lag of itself to determine whether the regression co-efficient of the lagged terms is essentially equal to unity and significant under the condition of no constant, some non-zero constant, or some no zero constant plus a deterministic trend co-efficient.

Consider the so called the autoregressive no constant test. The model to be tested presumes that the regression equation contains no significant constant term. The regression equation to be tested in the first difference is:

$$Y_t = \rho Y_t - 1 + \mu_t \qquad (2.2.2)$$

The regression equation without a constant means that the model tests for pure random walk without drift

$$Y_t = \rho Y_t - 1 + \mu_t$$
$$If \ \rho = 1; \ then$$
$$Y_t = Y_{t-1} + \mu_t$$
$$\Rightarrow Y_t - Y_{t-1} = \mu_t$$

$$(1 - L)Y_t = \mu_t \qquad (2.2.3)$$

$$t = \rho 1 - 1/Se(\alpha), \qquad /t/ > Tt$$

where T is the critical value of this first case the null hypothesis is that

$$Ho: \rho = 1;$$

If the null hypothesis cannot be rejected, the data generating process is inferred to have a
Unit root and to be non-stationary, Then the two sided significant test performed is that
For statistical significance of ρ-1, the test resembles a t-test. The null hypothesis that the
Series is a non-stationary random walk is rejected if $/t/ > Tt$, where the value of depend on the sample size at which other parameters in the equation (Dickey-Fuller Table) for critical regions value

2.3 Model Selection Criterion
In some contexts the econometrician chooses between alternative models based on a formal hypothesis test. For example, one might choose a more general model over a more restricted one if the restriction in question can be formulated as a testable null hypothesis, and the null is rejected on an appropriate test.
In other contexts one sometimes seeks a criterion for model selection that somehow measures the balance between goodness of fit or likelihood, on the one hand, and parsimony on the other. The balancing is necessary because the addition of extra variables to a model cannot reduce the degree of fit or likelihood, and is very likely to increase it somewhat even if the additional variables are not truly relevant to the data-generating process. The best known such criterion, for linear models estimated via least squares, is the adjusted R^2:

$$R^2 = 1 - \frac{SSR/(n-K)}{TSS/(n-1)} \qquad (2.3.1)$$

Where n is the number of observations in the sample, k denotes the number of parameters estimated, and SSR and TSS denote the sum of squared residuals and the total sum of squares for the dependent variable, respectively. Compared to the ordinary coefficient of determination or:

$$R^2 = 1 - \frac{SSR}{TSS} \qquad (2.3.2)$$

The "adjusted" calculation penalizes the inclusion of additional parameters, other things equal.

2.4 Information Criteria

A more general criterion in a similar spirit is [16] "Information Criterion" (AIC). The original formulation of this measure is:

$$AIC = AIC = -2L(\theta) + 2K \tag{2.4.1}$$

Where $L(\theta)$ represents the maximum log likelihood as a function of the vector of parameter estimates, (θ) and k (as above) denotes the number of "independently adjusted parameters within the model." In this formulation, with AIC negatively related to the likelihood and positively related to the number of parameters, the researcher seeks the minimum AIC. The AIC can be confusing, in that several variants of the calculation are "in circulation." For example, [17] present a simplified version:

$$AIC = L(\theta) - 2K \tag{2.4.2}$$

Which is just 2 times the original: in this case, obviously, one wants to maximize AIC.

In the case of models estimated by least squares, the log likelihood can be written as:

$$L(\theta) = -\frac{n}{2}(1 + \log 2\pi - \log n) - \frac{n}{2}\log SSR \tag{2.4.3}$$

Substituting eqn (2.2) in (2.1) we get

$$AIC = n(1 + \log 2\pi - \log n) + n\log SSR + 2K \tag{2.4.4}$$

This can also be written as:

$$AIC = n\log\left(\frac{SSR}{n}\right) + 2k + n(1 + \log 2\pi) \tag{2.4.5}$$

Some authors simplified the formula for the case of model estimated via least squares. William Greens writes:

$$AIC = \log\left(\frac{SSR}{n}\right) + \frac{2K}{n} \tag{2.4.6}$$

The variant can be written derived from eqn (3) by dividing through by n and subtracting the constant $(1 + \log 2\pi)$. That is, writing AIC_G for the version given by Greene, we have:

$$AIC_G = \frac{1}{n}AIC - (1 + \log 2\pi) \tag{2.4.7}$$

Finally, Ramanathan gives a further Variant:

$$AIC_R = \left(\frac{SSR}{n}\right)e^{2K/n} \tag{2.4.8}$$

This is the exponential of the one given by Greene. Although the Akaike criterion is designed to favor parsimony, arguably it does not go far enough in that direction. For instance, if we have two nested models with k - 1 and k parameters respectively, and if the null hypothesis that parameter k equals 0 is true, in large samples the AIC will Nonetheless tend to select the less parsimonious model about 16 percent of the time (see Davidson And MacKinnon, 2004, chapter 15). An alternative to the AIC which avoids this problem is the Schwarz "Bayesian information criterion" (BIC). The BIC can be written (in line with Akaike's formulation of the AIC) as:

$$BIC = -2L(\theta) + K\log n \tag{2.4.9}$$

The multiplication of k by $\log n$ in the BIC means that the penalty for adding extra parameters grows with the sample size. This ensures that, asymptotically, one will not select a larger model over a correctly specified parsimonious model. A further alternative to AIC, which again tends to select more parsimonious models than AIC,is the Hannan–Quinn criterion or HQC [18]. Written consistently with:

$$HQC = -2L(\theta) + 2K\log\log n \tag{2.4.10}$$

The Hannan–Quinn calculation is based on the law of the iterated logarithm (note that the last term is the log of the log of the sample size). The authors argue that their procedure provides a "strongly consistent estimation procedure for the order of an auto regression", and that "compared to other strongly consistent procedures this procedure will underestimate the order to a lesser degree."

2.5. Co-integration

We have warned that the regression of a non-stationary time series on another non-stationary time series may produce a spurious regression result. Suppose we have two economic variables Y_t and X_t, subjecting this two time series individually to a unit root analysis you will find out that they are both I(1); that is, they contain a unit. Suppose we regress Y_t on X_t as follows:

$$Y_t = \beta_1 + \beta_2 X_t + \mu_t \tag{2.5.1}$$

Suppose you subject μt to unit root analysis and find that is stationary; that is, it is I (0). This suggests that they have a stochastic trends, their linear combination cancels out the stochastic trends in the two series, in this case we say the two series are cointegrated. Economically speaking, two variables are cointegrated if they have a long-term, or equilibrium relationship between them. Economic theory is often expressed in equilibrium terms. They valuable concept of unit root, cointegration, etc. is to force us to find out if the regression residuals are stationary. As Granger notes,"A test for cointegration can be thought of as a pre-test to avoid spurious regression. In the language of cointegration theory, a regression such as (2.5.1) is known to be cointegrating regression and the slope parameter β_2 is known as the cointegrating parameter. The concept of co-integration can be extended to a regression model containing k regressors.in this case we will have k co-integrating parameters.

2.5.1 Testing For Cointegration
 A number of methods for testing co-integration have been proposed in the literature. We consider here comparatively simple methods
   1. The Dickey-fuller or ADF unit root test on the residuals estimated from the co-integrating regression and
   2. The co-integrating regression Durbin-Watson (CRDW)test.

 2.5.2 Engle-Granger (EG) or Augmented Engle Granger (AEG) test
 We already know how to apply the DF or ADF unit root tests. All we have to do is to estimate regression model parameters, obtain the residuals, and use the DF or ADF tests. There is one precaution to exercise, however. Since the estimated μt is based on the co-integrating parameter β2, the DF and ADF critical significant values are not quite appropriate. Engle and Granger have calculated these values, which can be found in the table. Therefore, the DF and ADF test in the present context are known as Engle-Granger (EG) and Augmented Engle-Granger (AEG) tests.

2.5.3 Co-integration and Error Correction Mechanism
 A mechanism in a model that corrects long-run equilibrium error in co-integrating regression, the model is that of the difference of Y_t regressed on difference of X_t plus an error correction mechanism. That mechanism is a factor that captures the long run equilibrium correction.
2.5.4 Error Correction
 A model where there is a correction for past, current or expected disequilibrium, adaptive expectations, partial adjustments, and co-integrated regression models are sometimes referred to as error correction models (ECM)

III.   Methodology
 The significant increase in FDI flows to developing countries in general and Nigeria particular over the last decade (2002-2012) is due to the liberalization of the economy. The flow of FDI also contributes to technology development vis a vis industrial development of the host country. That is the main reason that the developing, along with developed, countries in the world have done much in liberalizing the economy to attract foreign investors. Even then the host countries will have to focus their attention on whether this source of financing enhances overall economic growth. A regression was run for the last 40 years (1970-2010) to look into what factors could affect the inflow of FDI to Nigeria keeping in view the previous studies as analyzed in the previous section of the paper. Different explanatory variables have been used to analyze their attributes in affecting the inflows of FDI to a host country, which include profitability, exchange rate, GDP and trade (Dunning-2001).
 In a country like Nigeria, foreign investors will seek to pay lower rate of tax on the return of investment as a premium for their risk-taking a country with history of political instability and violence (Venkataramany-2002). To find out the effects of political instability risk on the inflows of FDI to a country in general and Nigeria in particular, PRI has been calculated using the qualitative information on various components of PR. ICRG methodology has been used to produce composite PRI utilizing the available information on various components like government stability, ethnic violence, religious militancy etc.
 Looking into the Stationarity and non-Stationarity of the macro-economic time series data from 1970-2010, we will make a further analysis of two-way causality and long-term relationship of the determinants and FDI inflows. The following basic model will be used to test the hypothesis of causality and long-term relationships and explore the effect of the independent variables GDPR, Openness of Economy, real exchange Rate Stability, discount rate differential, and the most important determinant of Political Risk Index of the host country, etc.:
  K = f (Y, OE, DR, PRI) (I)

K as real FDI stock derived from the years inflows Y as (Gross Domestic Product in Real terms), OE as (Openness of Economy), DR (difference between US discount rate and Nigeria discount rate), and PRI as (Political Risk Index).

In this paper, we have concentrated on the preparation of properties of time series data before the estimation of **FDI** and **GDPR, PRI, DR, OE** explanatory variables in the scenario of political situation and economic growth of Pakistan. The estimation procedure has been adopted in the sequence.

The lack of consensus and the robustness is due to the lack of data for the world in general and Nigeria in particular, which depends upon the country level. Most of the studies have found it difficult to find data for developing countries.

3.1 Empirical Analysis:

This section presents empirical results on the relationship of foreign direct investment (**FDI**) inflows and FDI Stock and **GDPR, PRI, DR, OE** of Nigeria. As our focus is on Nigeria in particular, we undertake a time-series analysis of data from Nigeria for the previous 40 years (1970-2010).

Indexed values for all variables have been used to carry out empirical analysis. Prior to testing for non-causality, it is necessary to establish the order of integration present. To this end, an Augmented Dickey-Fuller test (ADF) was carried out on the time series in levels and differenced forms. We carried out the tests on time series of **FDI, GDPR, PRI, DR, and OE** for Nigeria for the period 1970-2010. If we accept the null hypothesis that a time series is non-stationary (has at least one unit root), we then re-apply the procedures after transforming the series into first differenced form

3.2 Model Specifications:

$$FDI = \beta_0 + \beta_1 GDP + \beta_2 EXP + \beta_3 IMP + \beta_4 INFLATIO + \beta_5 EXCHRAT + U_t..(1)$$

Where; β_0, β_1, β_2, β_3, β_4, β_5, are coefficients of elasticity, and U_t the disturbance term. We expect FDI to be positively related to the host country's market size

IV. Data Analysis and Discussion of Results

The data employed in this study is purely secondary in all respects; lifted directly from the Central Bank of Nigeria (CBN) statistical bulletin for the period 1970-2010. The variables are measured as follows: Foreign Direct Investment (FDI) obtained from the total inflows of FDI into Nigeria, Gross Domestic Product (GDP) as measure of host country's market size, openness of the market captured Export (EXP) and Import (IMP), Exchange rate (EXCHRRATE) as the total rate at which Nigerian currency is converted to the US dollars and lastly, changes in the general price level of goods and services in the country as Inflation (INFL)

4.1 Non-Stationarity / Stationarity

The results of unit root test in levels and differences are presented in Table -1 & 2. The critical values of ADF can be computed using the algorithm of Mackinnon (1991). Two critical values with constant and time trend are reported; with constant but no time trend at 5% significant level has been reported by Microfit 4.0 as – 3.7835 & -2.7650 respectively.

Table 1: Test Of The Unit Root Hypothesis I(0)

LK		LYR	LOE	LDR	LPRI
τc+t	-4.67428(0)	-3.8765(0)	-2.3443(0)	-1.4946(0)	-3.5681(0)
	-3.78542(1)	-2.49272 (1)	-2.8024(1)	-2.1036 (1)	-3.5702 (1)

τc+t: The data is with constant and time trend, critical values at 5% significance level are reported by Microfit 4.0 = -3.7835. The lag length is given in parenthesis

Since the absolute value of the ADF test statistic is less than the absolute value of the critical values (at all three commonly-used significance levels), we do not reject the null hypothesis of non-stationary and conclude that FDI, GDP, ExR, OE, MMIR, and UEr, has a unit root.

Also only the constant and trend results have been used for analysis as the data series under consideration are time trended.

Table 2: Test of the Unit Root Hypothesis (I (1)) Dk

		DYR	DOE	DDR	DPRI
τc	-6.4532*(0)	-4.86541*(0)	-4.2132*(0)	-3.6875*(0)	-5.0053*(0)
	-7.0234*(1)	-4.23451*(1)	-4.6543*(1)	-2.5815 (1)	-6.4831*(4)

τc = The data is with no constant and no time trend, critical values at 5% significance level are reported by Microfit 4.0 = -2.7650. The lag length is given in parenthesis.

4.3 Multiple Cointegration and ECM Estimation

(a) Johenson Approach [19] procedure has been used for multiple co-integration VAR(2). The results presented in Table 3 suggest and indicate that that there exist at most r=4 co-integration vectors evidence of multivariate co-integration between the variables, which also gives an indication of long run relationship among the variables for which an error correction model estimation has been implied.

Table 3: Johansen's Test For Multiple Cointegration Vectors

Vector	Hypotheses		Tests Statistics	
	H0:	H1:	Max Eigenvalue	Trace
[k,yr,oe,dr,pri]	*r = 0*	*r > 0*	362.136**	125.652**
	r ≤ 1	*r > 2*	19.234*	35.475**
	r ≤ 2	*r > 3*	18.123	25.678*
	r ≤ 3	*r > 4*	7.567	21.567
	r ≤ 4	*r > 5*	2.654	2.654

The ADF tests of the key variables in the system: **GDPR, OE, DR, PRI** and **FDI** indicated that these variables were non-stationary in their levels but stationary in their first differences. **GDPR, OE, DR, PRI,** and **FDI** are at the current market prices. The error-correction co-integration analysis (ARDL) has been undertaken for the period as a whole (1970-2010). If two variables are co-integrated, it implies there is a stable long-run relationship between them. However, in the short run there may be disequilibrium. However this short run disequilibrium can be corrected by **error correction mechanism (ECM)**.

(b) Error Correction Model (ECM) estimation

The simplest example of an ECM is: $\Delta = \Delta\Delta\Delta kt fr yr eo rd pri$,,,(*(II)*
The results presented in Table 4-7 have been obtained using ECM equation.

Table 4: ARDL Error Correction Model Presentation, 1970-2010

Dependent Variable: FDI stock (ΔK) with YR **Regressor**	Coefficient	Standard Error	T-Ratio [Prob]
ΔLK1	.43216	.123671	3.432194[.000]
ΔYR	-.13212	.063041	-1.42310[.026]
Δconstant	1.6401	.460362	3.231197[.021]
ecm(-1)	-.12149	.034214	-18.23143[.000]
ARDL (2,0) selected based on Schwarz Bayesian Criterion ΔLK = LK-LK (-1) ΔLK1 = LK(-1)-LK (-2) ΔLYR = LYR-LYR (-1) ΔConstant = Constant-Constant (-1) ecm = LK-11.5760*constant+ 1.5400*LYR R-Squared = .54664; R-Bar Squared = .49626; F-stat. = 10.8516 [.000]			

Table 5: ARDL Error Correction Model Presentation, 1970-2010

Dependent Variable: FDI stock (ΔK) with OE **Regressor**	Coefficient	Standard Error	T-Ratio [Prob]
ΔLK1	.321280	.123140	2.32562[.002]
ΔLOE	-.21214	.071995	-1.8868[.040]
ΔConstant	.87721	4.2803	2.0356[.062]
ecm(-1)	-.031256	.042966	-2.8777[.005]
ARDL (2,0) selected based on Schwarz Bayesian Criterion ΔLK = LK-LK (-1) ΔLK1 = LK(-1)-LK (-2) ΔLOE = LOE-LOE (-1) ΔConstant = Constant-Constant (-1) ecm = LK-21.6324*constant+ 4.0780*LOE R-Squared = .45032; R-Bar Squared = .44935; F-stat. = 10.2104 [.000]			

Table 6: ARDL Error Correction Model Presentation, 1970-2010

Dependent Variable: FDI stock (ΔK) with DR **Regressor**	Coefficient	Standard Error	T-Ratio [Prob]
ΔLK1	.42500	.38453	2.8724[.076]
ΔLK2	-.37784	.12543	-4.0934[.005]
ΔLDR	-.002312	.2800E-4	-2.3451[.002]
ΔConstant	.436603	.210750	2.4478[.001]
ecm(-1)	-.087556	.021590	-3.8959[.001]

ARDL (3,0) selected based on Schwarz Bayesian Criterion
ΔLK = LK-LK (-1)
ΔLK1 = LK(-1)-LK (-2)
ΔLK2 = LK(-2)-LK (-3)
ΔLDR = LDR-LDR (-1)
ΔConstant = Constant-Constant (-1)
ecm = LK-3.6271*constant+ .021649*LDR
R-Squared = .79910; R-Bar Squared = .75394; F-stat. = 21.3621 [.000]

Table 7: ARDL Error Correction Model Presentation, 1970-2010

Dependent Variable: FDI stock (ΔK) with PRI **Regressor**	Coefficient	Standard Error	T-Ratio [Prob]
ΔLK1	.84572	.19752	5.5795[.001]
ΔLK2	-.24302	0146 0	-2.9150[.067]
ΔLPRI	-.00435	.00620	-.43265[.070]
ΔConstant	.076197	.0649	2.45120[.201]
ecm(-1)	-.02387	.00203	-1.5341[.018]
ARDL (3,0) selected based on Schwarz Bayesian Criterion ΔLK = LK-LK (-1) ΔLK1 = LK(-1)-LK (-2) ΔLK2 = LK(-2)-LK (-3) ΔLPRI = LPRI-LPRI (-1) ΔConstant = Constant-Constant (-1) ecm = LK-4.5560*constant+ .32021*LPRI R-Squared = .63230; R-Bar Squared = .55981; F-stat. = 5.7787 [.001]			

4.3 Causality Estimation Results

We begin employing Granger's causality test to analyze the inter relationship between **GDPR, FDI**. We have conducted bivariate between every pair of variable using two variables. The methods used are specified with an hypothesis of H_0 = No Causality between **FDI** and **GDPR** as below:

4.3.1 Granger Causality Analysis

The results of bivariate analysis are presented in table-7. The choice of lag length is based on Akaike Information Criteria (AIC), and Schwartz Criteria (SC). Our Results show two way causality between **GDPR, OE, DR, PRI**.. In other words the no causality hypothesis can be rejected at the 5% level of significance (table-9)

Table 9: Granger Causality Results

Variable	Direction of Causality	Chi-square Statistics	Chi-square (Probabilities)	Result
YR (Y) **FDI (I)**	Y ⟶ I	16.2210*(2)	[.000]	Reject H_0
	I ⟶ Y	13.9132*(2)	[.006]	Reject H_0
O E (Y) **FDI (I)**	Y ⟶ I	20.9906* (2)	[.000]	Reject H_0
	I ⟶ Y	4.2618*(2)	[.056]	Reject H_0
DR (Y) **FDI (I)**	Y ⟶ I	8.5456*(2) 22.2662*(3)	[.042] [.000]	Reject H_0
	I ⟶ Y	19.8034(2) 18.9568(3)	[.000] [.001]	Reject H_0
PRI (Y) **FDI (I)**	Y ⟶ I	19.8613*(1)	[.006]	Reject H_0
	I ⟶ Y	28.9056* (3)	[.000]	Reject H_0

The hypothesis of bi-directional Non-causality for **GDP** and **FDI** can be rejected at 10% & 5% significant level, which suggest that there is a mutual causal relationship between GDPR growth and FDI. This result is in line with the findings of [20], who report a bi-directional causality between FDI and Growth. The lags are shown in parenthesis in the 1st column. There is evidence for a co-integrating relationship if:
(a) The unit-root hypothesis is not rejected for the individual variables.
(b) The unit-root hypothesis is rejected for the residuals (uhat) from the co-integrating regression.

From the result we found that all the variables have unit root imbedded in them as such, the unit root test for the residual is rejected with p-value of 0.04937 and conclude that there is a long-run equilibrium relationship among the variables, the co-integrating regression is given as:

ΔFPI = -3.900.86– 1148.98ΔExrte+57205.3ΔEximp +0.0221ΔGDP+355.402t -0.62t^2
(-1.224)   (-0.7987)   (0.6558)   (12.05)   (0.76)   (-0.512)

Adj. R^2 = 0.917517

FDI = Foreign Direct Investment in Nigeria
Exrate = Exchange rate from Naira to Dollar

EXIMP = ratio of export to import
GDP = Gross Domestic Product of Nigeria finally we have the inflation rate.T denotes the time trend and T^2 represent the quadratic time trend in the data. The values in the brackets are the t-ratio. The Adj. R^2 of 0.917517 indicates that the predictors explains about 91.75% the variation in the explaining how these macro-econometric variables in attracting Foreign Investors to Nigeria.

The model adequacy was selected based on the AIC value, the model with the smallest AIC value is considered best. A test for autocorrelation was further used to determine if there is a relationship between the error terms as such the DW statistic of 1.96 indicates the lack of present of autocorrelation on the residual. The model co-efficient known as the co-integrating parameters shows that only the GDP as the measure of Host economy market size is considered significant with a probability-value of less than 0.00001.the inflation rate was omitted from the model due to the fact that there is an exact collinearity with some predictors; to avoid the effect of multicollinearity we discard inflation rate. The negative sign carried out by the constant term and exchange rate indicates that the lower the exchange rate of naira to Dollar the more foreign investors will invest in our country per unit increase of GDP as the measure of Market size the FPI will increase by 0.0221, per unit increase of the ratio of the export to import which is the measure of the Openness of the economy the FPI will increase by 57205.3 and per unit increase in the Exchange rate of Nigeria money the FPI will decrease by 1148.98 and per unit increase in time trend the FPI will increase by 355.402 and finally per unit increase of a quadratic time trend the FPI will reduce by 0.624377

V.   Summary and Conclusion
This has been a brief examination of the results of the study on the Determinants of FDI Flows into Nigeria over the period 1970 to 2010. This study therefore examined the issue of Foreign Direct Investment (FDI) on the Nigerian Economy. In this paper, we have examined the effect of three major macroeconomic and socio political determinants on FDI inflows to Nigeria. The approach is important because developing countries in general and Nigeria in particular have a fragile economic condition along with an unstable political environment since 1970. The ECM model reveals some salient features of the short-run determinants of FDI in Nigerian. In common with previous studies, the hypothesis that the level of FDI is influenced by exchange rate, the degree of openness of the economy and unemployment rate as well as political risk index, is supported.. This study has been a macro one and has not looked at such factors as regional and industry variations in FDI into Nigeria. Further the positive results of test of co-integration show the causality relationship between FDI, macroeconomic and socio political factors of Nigeria. The results support the theoretical contention and give strong support to the hypothesis that FDI inflows to Nigeria is dependent on the major macro-economic factors along with the most important socio political determinant known as PRI of the country like Nigeria with such changing political environment internally and externally in the region.

In sum, our econometric estimates of the net FDI flow model for Nigeria suggest that there exists a long run relationship between **FDI**, and **GDPR, EXR, OE, DR, PRI**. In short, these findings suggest Nigeria's economic growth, stable exchange rate, openness of market, lower discount rates in general and stable political environment has long run relationship with FDI inflows and stock.

Foreign Direct Investment (FDI) which is an engine of an economic growth is determined by the openness of an economy that is the ability to export and import goods, lower exchange rate compare to that of dollar [21], the market size of the host country as also attracts foreign investors [22]. Arguments has been made pertaining the impact of FDI in the growth of economy of which it was over emphasized by many literatures the problems we faced in Nigeria such as the Unemployment rate and the low falling growth rate of FDI. This has stimulated a lot of argument in the literature. Among the major findings also; was that the market size proxied by GDP has a significant impact for attracting foreign investors in Nigeria, this is in tune with the findings of [23]; the exchange rate has a negative impact to attracting foreign investors in the sense that the lower the exchange rate of naira to dollar the higher foreign countries will like to invest in our country, this of course contradict the findings of [24] and [8]

Based on some results from literatures it's obvious that in other developing countries, most of the FDI incentives are not only the market size such as china, but in the case of Nigeria is different; only the market size has statistically significant contribution in attracting foreign investors.

VI. Policy Recommendations Based On the Findings

Based on the above, it can be deduced that despite the fact that market size does not have positive impact on the FDI of other developing countries which will create room for contradiction, in the case of Nigeria it is quite a little different, market size of the host country has positive significant effect on FDI. By some factors; issues on FDI should not be ignored in policy decisions aimed at development or promoting the economy of our great country Nigeria.

Government should look into the issue of unemployment with all seriousness; which is currently bedeviling our dear nation Nigeria, by providing the policies and the enabling environment that would facilitate the inflows of FDI.

There is need for our political institution to be strengthened as this will go a long way in safeguarding the democratic principles of our dear nation; for stability and prosperity

Government should invest heavily in basic infrastructure such as roads construction, electrification, ports and reliable means of communication as many studies indicates such has help significantly as far as FDI inflows is concerned in countries like china, Brazil, Thailand, e.t.c especially the transport facilities and proximity to port.

Labour being a significant factor for FDI inflows, investors are advice to come and invest in Nigeria, since there is available relatively low labour costs; especially in northern Nigeria.

The government should put more effort on Determinants of FDI as the process of developing the Nigerian Economy, recognizing the fact that FDI induces job creation which in turn alleviates poverty and solving security problems currently facing our dear nation Nigeria.

References

[1] E. Faut and T. Ekrem, locational determinant of foreign direct investment in emerging economy: Evidence from Turkey, *Multinational business review 10(1),* 2002

[2] J. C Anyanwu, An econometric Investigation of Determinants of FDI in Nigeria: *Nigeria Economic Society Annual Conference Publication,* Lagos, 1998

[3] A.B Ayanwale, FDI and Economic Growth: Evidence from Nigeria" AERC *Bulletin*, 2007, 108-112.

[4] Broadman and Sun, The distribution of foreign direct investment in china, *The world economy, 20(3)* 1997

[5] O. Bajo-rubia and S. sosvilla-Rivera x, An econometrics analysis of foreign direct investment in Spain, *Southern Economic journal, 61 (1),* 1994, 104-117

[6] P. Tsai, Determinants of Foreign Direct Investment and its Impact on Economic Growth, *Journal of Economic Development, 19*, 1994, 137-163.

[7] O. G. Wafure,. and A. Nurudeen, Determinants of Foreign Direct Investment in Nigeria: An Empirical Analysis, *Global Journal of Human Social Science,* 10(1), 2010

[8] H. Masyuki, and f. ivohasina, The Determinants of Direct Investment into japan, *Kobe University Economic Review* 51, 2005.

[9] A.H. Ekpo, Foreign Direct Investment in Nigeria: Evidence from Time Series Data, *CBN Economic and Financial Review, 35(1)*, 1997

[10] D. Olatunji, , At home Abroad when Titles get in way the Nation Newspapers Tuesday, September, 25, 2001

[11] D. Sounyananda, *Factors Affecting FDI to Nigeria:* An Empirical Investigation, Munich Personal (Repec Archive, Munich University Library Germany, 2008)

[12] Nwankwo, L. I. (2006). "A least squares plane surface polynomial fit of two dimensional potential field geophysical data using Matlab". *Nigerian Journal of Pure and Applied Sciences*, 21, 2006 – 2012. Publisher: Faculty of Science, University of

[13] J. A. Aremu, Foreign Private Investment: issues, Determinants, Performance and Promotion: A paper presented at *workshop on foreign investments, policy and practice,* Nigerian institute of advanced legal studies, lagos 1997

[14] C.C.Soludo, , Investment in the Growth Process: A Measure of the Economists' Ignorance in Africa, *Nigerian Economic Society, Re-Kindling Investment for Development in Nigeri.*, Lagos1998,

[15] A.H Ekpo and F. Egwaikhide, Private investment and external debt: is the debt overhang hypothesis relevant to Nigeria, *The Nigerian journal of economic and social studies, 40(1)* 1998, 87-100

[16] R. Engle and C. Granger, Cointegration and Error Correction: Representation, Estimation Series with Unit Root, *Journal of the American Statistical Association, 74*, 1987, 427-431.

[17] J.H. Dunning, Determinants of FDI: Globalisation and Role of Policies, Economist Intelligence Unit's *World Investment Prospects,* London, 2002.

[18] Hannan and Quins, The Determinant of the order of an Autoregression, journal of royal statistical society, 41(2), 1979

[19] A Johansen, and K. Juselius, Maximum Likelihood Estimation and Inference on Cointegration with Applications the Demand for Money, *Oxford Bulletin of Economics and Statistics,* 52, (2), 1990, 169-210.

[20] A. Moudatsou**,** FDI and Economic Growth: *Evidence from 14 EU countries,* 2001

[21] M. O. Moore, Determinants of manufacturing Direct Investments, *weltwirtscftsliches archive, 129,* 1993, 120-137.

[22] G. Ragazzi, Theories of The Determinants of Foreign Direct Investment: The IMF staff papers, 20, Research Paper 165, *African Economic Research Consortium,* Nairobi, 1973, 471-498

[23] A. Chakrabarti, The Determinants of Foreign Direct Investment, *Sensitivity Analysis of cross- country Regression" kyklos*, 54(1) 2001, 89-114