ABSTRACT: This study examines the real exchange rate instability and foreign private investment in Nigeria. The economy of Nigeria is faced with fluctuations in real growth rates, price inflation, investment per capita, government revenue per capita and real exchange rate. Therefore, this study adopted time series econometrics analysis and descriptive statistics to ascertain the impact of exchange rate on increase/decrease of foreign direct investment in Nigeria and to determine the causal relationship between exchange rate volatility and private investment spending. The empirical analysis that was carried out to achieve the objectives mentioned above, include the econometric tests such as unit root, co-integration, and Error correction model in which CFPI was regressed on real exchange rate, inflation rate, interest rate and real GDP using annual series data for the period 1986-2008, and the data was mainly from CBN statistical bulletin. The result of our analysis shows that test statistics are greater than the critical values. The study also found that long-run relationship exists between the CFPI and the explanatory variables; EXR, INF, INT and GDP. Based on the findings above, the study recommends that Government should adopt other macroeconomic variables which will encourage foreign investors to come in. The study equally recommends that Efforts should be geared by government to reduce exchange rate distortions or misalignment, increase export of locally manufactured goods and raw materials in a bid to raise value of the local currency.

1.1 INTRODUCTION
Economic theory as proffered by the neoclassical economists holds that growth is brought about by increases in the quantity of factors of production and in the efficiency of their allocation, Oviemuno (2007). In line with this, Dutse (2008), stated that key strategies for ensuring economic revival and growth lies in the promotion and facilitation of technology transfer through Foreign Private Investment (FPI). In effect, he was saying that International Capital Flows (ICFs) have readily become an important means of helping developing countries to overcome their capital shortage problem.
Adofu (2009) noted that there has been deficiency in the capital accumulation needed for increased level of investment in Less Developed Countries (LDCs), Nigeria in particular. This is due to the fact that there exists low level of savings which is caused by factors such as high level of poverty, weak financial system which cannot properly mobilize funds internally, etc. According to Adeleke (2009), Foreign Private Investment can be classified as Foreign Direct Investment (FDI) and Portfolio Investment. FDI is an investment in real assets, where real assets consist of physical things such as factories, land, capital goods, infrastructure and inventories. The Multinational Corporations (MNCs) is chief source of FDI. This may come in both joint ventures as well as fully owned subsidiaries. Whereas, international investment in financial assets such as shares, debentures and bonds are referred to as Foreign Portfolio Investment. Summarily, it is held that FPI allows for a more efficient allocation of resources for the investing firm in the home country. The host country, on the other hand benefits from knowledge transfers and spillovers as well as inciting competition and increased productivity.

Foreign Private Investment no doubt has positive contributions to the economy. Nevertheless, it has its own constraints to its free flow. This study seeks to identify these constraints as well as relating them to the degree of flow of FPI. Generally, it will focus on examining the factors (especially exchange rate) that influence Foreign Private Investment.

To the fact that exchange rate affects expected future profits, uncertainty about the future evolution of the exchange rate can influence foreign investment decisions. According to Schmidt et al (2008), since the end of the Bretton Woods era of fixed exchange rates the importance of exchange rates has increased in many ways. Global capital and trade flows are dependent on the valuation of currencies and exposed to related exchange risk. The decision of an MNC to engage in international trade or foreign investment is based in part on the current situation of exchange markets as well as on future prospects for these markets. Upon the demise of the Bretton Woods system, a generalized system of floating exchange rates emerged, particularly for the developed countries. The developing countries have had varied experiences with exchange rate regimes. Since the mid-1970s, the developing countries have moved to either pegging to a basket of major currencies, away from a single currency peg, or adopting a more flexible exchange rate regime, Obadan (2009).

In order to reduce the uncertainties arising from the medium – or long-term swings of major currencies which have produced various problems for them, developing countries have had the inclination to adopt intermediate exchange rate regimes rather than the polar regimes of firmly fixed exchange rate and floating exchange rates. Since the early 1990s two notable developments have conditioned the type of exchange rate regimes adopted by the developing countries; these are the intensification of globalization and emergence of financial crises.

The choice of exchange rate regime by developing countries is of crucial importance to their self-protection from speculative attacks and currency crisis as well as achievement of long-term growth. And the choice of exchange rate regime in the developing countries means which regime would be most appropriate not only for preventing massive capital inflows and currency crises but also for better facilitation of trade, FDI and economic growth. In the light of the foregoing, it implies that more access to the global capital market by developing countries poses a policy dilemma for the choice of exchange rate regime.

1.2 STATEMENT OF THE PROBLEM

Drawing from the above analysis, one cannot underestimate the impact of macroeconomic volatility as reflected by movements or fluctuations in real growth rates, price inflation, investment per capita, government revenue per capita and real exchange rate. Udoh and Egwaikhide (2008) isolated some reasons why research into the impact of macroeconomic volatility on foreign investment inflows is important for a developing resource-based economy like Nigeria. Amongst the reasons they identified are; first, macroeconomic volatility represents a measure of the uncertainty that economic agents face about the future. In turn, uncertainty affects the future level of growth and investment. Second, government policy is often directed towards reducing volatility by smoothing out the fluctuations in the time path of income, price and investment, among others. Finally, they noted that with regard to FDI, domestic instability affects the value of the host country’s currency, thus reducing the value of the investment as well as the future profits generated by the investment.
Several factors influence the choice of one regime over the other. A major consideration is the internal economic conditions or fundamentals, the external economic environment and the effect of various random shocks on the domestic economy. Thus, countries like Nigeria which are vulnerable to unstable internal financial conditions and external shocks, (including terms of trade shocks, and excessive debt burden), which require real exchange rate depreciation, tend to adopt a regime which ensures greater flexibility. Overall, there is a general consensus that a fixed exchange rate regime is preferred if the source of macroeconomic instability is predominantly endogenous. Conversely, a flexible regime is preferred if disturbances are predominantly exogenous in nature. It is, nevertheless, becoming increasingly recognized that whatever exchange rate regime a country may adopt, the long-term success depends on its commitment to the maintenance of strong economic fundamentals and a sound banking system.

1.3 OBJECTIVES OF THE STUDY
This study is set out to achieve the following core objectives;
1. To ascertain the impact of exchange rate on increase/decrease of foreign direct investment in Nigeria.
2. To determine how exchange rate uncertainty affects the future level of investment.
3. To determine the causal relationship between exchange rate volatility and private investment spending.

1.4 SCOPE OF THE STUDY
In order to concisely examine the impact of exchange rate on the inflow of FPI into Nigeria, this study will employ the use of the Nigerian annual time series data from 1986 to 2008 (a period of twenty three years). The variables that would be covered within the data set are; Exchange Rate, Cumulative Foreign Private Investment, Interest Rate and Gross Domestic Product (GDP). This period was selected for the purpose of this study because it covers the SAP and post SAP era, which marked the beginning of trade liberalization and openness. It would thus provide a good front at capturing the degree of inflow of FPI into Nigeria and the effects of macroeconomic forces (like exchange rate) on it.

2.1 THEORETICAL LITERATURE
"... Capitalism stands alone as the only feasible way to rationally organize a modern economy. At this moment in history, no responsible nation has a choice. As a result, with varying degrees of enthusiasm, Third World and former Communist nations have balanced their budgets, cut subsidies, welcomed foreign investment, and dropped their tariff barriers…. For much of the world, the marketplace extolled by the West in the afterglow of victory in the Cold War has been supplanted by the cruelty of markets, wariness toward capitalism, and dangers of instability” – Hernando De Soto (2000); The Mystery of Capital.

We live in a globalized world. Because of the increasing integration of global financial markets brought about by globalization, there has been renewed interest in analyzing the effects of macroeconomic uncertainty and volatility on foreign investment decisions of private firms, Demir (2009). Globalization gave rise to financial liberalization, and researchers have argued that this has left in its wake serious bottlenecks in the developing world i.e. higher levels of uncertainty and volatility in key macro-prices as well as increasing sensitivity of domestic variables to changes in international markets.

Studies have shown that in International Business uncertainty, which often exposes Multinational Enterprises (MNEs) to unfavourable conditions or favourable opportunities, plays an important role in their strategic decision making, Li, J. and Alan, M. R. (2007). These challenges and opportunities in the international environment demand a theory, which helps to analyze MNE’s strategies under uncertainty.

The neo-classical theory of investment postulates that a firm should invest in a project as long as the present value of the expected stream of profits that this project will generate should exceed (or at least equal) the present value of the expenditures stream required to build the project. Thus, the Net Present Value (NPV) of the investment project is greater than zero, Ali Termos (2008). This theory however, fails to capture three main characteristics in most investment decisions. These are;
1. **Irreversibility**: A neo-classical NPV calculation would implicitly assume that if economic conditions turn to be sluggish, the firm shuts down the project and recovers invested funds. This is usually not realistic.

2. **Uncertainty**: A neo-classical NPV calculation again does not assess probabilities of alternative outcomes over the future of the project life, especially as it relates to fluctuating macro variables with direct impact on the project.

3. **Timing of Investment**: Firms can postpone their investment to obtain more information about the future, albeit never complete information. The ability to delay an irreversible investment project can affect the decision to invest. Based on the foregoing, the conclusion is that the traditional neo-classical NPV valuation of investment decisions has fundamental limitations in the areas of; Fixed Cash flows, Simplification of risk and no flexibility, Andreas Lindinger (2005).

Taking into consideration the ‘timing of investment’, we look at the ‘Real Options Theory’, first developed by McDonald and Siegel in 1986. The theory stipulates that firms with an opportunity to invest are holding an ‘option’ analogous to a financial call option. When a firm makes an irreversible investment, it exercises its option to invest. Doing so, the firm gives up the possibility of waiting for new information to arrive. That might affect the decision to invest now. This lost option value is an opportunity cost that must be included as part of the cost of the investment. Therefore, the value of the project must exceed the investment cost, by an amount equal to the value of keeping the investment option alive. Besides its feasibility, the real options theory or model reflects the variations in value for any investment project in a continuous setting that is reflective of real economic variations, for example, fluctuations in exchange and interest rates, Andreas Lindinger (2005).

### 2.2 Overview of foreign Investment in Nigeria

Nigeria has a great potential for attracting foreign investment. It has a large market, rich natural resources and cheap trained labour force. However, statistics show that the country has not benefited much from foreign investment flows. Since 1990, net foreign direct investment flows to Nigeria has been fluctuating and declining. World Bank Report (1998). For example, out of the US $25.0 billion investment inflow into all developing countries in 1990, Nigeria accounted for US $ 0.6 billion or 2.4 percent. But by 1993 when the flow to all LDCs increased to US $ 67.6 billion, Nigeria’s share declined to US $ 1.3 billion or only 1.9 percent. The share was only 0.9 percent in 1997. This dismal performance has been attributed to the following factors; macroeconomic instability, as evidenced by rising inflation, interest and exchange rate volatility, arising from fiscal dominance, amongst others.

### The Nature and Importance of Foreign Direct Investment in Nigeria

Medupin (2002) has stated that at independence in 1960, private foreign investment in Nigeria accounted for 70% of the total industrial investment and over 90% of investment in such basic industries as chemical production, and vehicle assembly plants and no less than 90% of other manufacturing sub-sectors. Foreign Private Direct Investment (FPDI) dominated banking, insurance and mining before the indigenisation programme (through the Nigerian Enterprises Promotion Decree, 1972). Presently, FDPI controls the Oil and Gas Investment in Nigeria, in the up stream sector. Nigeria is not a major destination of FDI. Meier (1995) showed that of the US $35,895 million FDI to developing countries in 1991, 66.7% went to ten countries and Nigeria was not one of them.

In fact, Nigeria’s share was 1.8% of the total FDI to all developing countries (IMF, 1992). In the same year net foreign private capital into Nigeria was N1,808m (or US $182.5m, using average annual exchange rate of N9.9095/ US $1.00) and equivalent to 0.51% of the FDI that went to all developing countries. By year 2000, the flow of FDI increased and Nigeria was still not among the top ten recipients though her share of the FDI relative to other developing countries increased marginally to 1.9% (World Bank, 2002).

In terms of sectoral analysis table 3.2 shows that in 1970, Mining and Quarrying and Manufacturing sectors absorbed 73.8% of total private investments in Nigeria while the trading and business services sector top up 20.6 of the balance of 26.2%. This pattern was maintained in 1980 and 1990 when the two sectors – Mining and Quarrying and Manufacturing absorbed 60.2% and 71.2% respectively of the Cumulative private foreign investment. However, manufacturing
overtook mining and quarrying as preferred activities: in 1970, manufacturing was 22.4%, in 1980, it was 41.5% and by 1990, it further increased to 60.7%. It is observed that in the 1990s, the results are reversed but the two activities together still account for more than 50% of Cumulative private foreign investment. Before the structural adjustment and subsequent reform programmes, the two sectors had policies that encouraged private foreign investment. This was not the case with the agricultural sector (which is not significantly entrepreneurial) and transport and communication, which were state monopolies.

Exchange Rate Volatility and Foreign Investment

Foreign investment, like other forms of investment, also depends on non-economic factors such as risk, macroeconomic volatility and political instability. Volatility represents the degree to which a variable changes over time. The larger the magnitude of a variable change, or the more quickly it changes over time, the more volatile it is. A floating exchange rate may or may not be volatile depending on how much it changes over time. However, since floating exchange rates are free to change, they are generally expected to be more volatile than fixed exchange rates, S. M. Suranovic (2009).

Foreign Direct Investment (FDI) which is a key component of Foreign Private Investment, is a forward-looking activity based on investors’ expectations regarding future returns. Therefore, variables such as risk and macroeconomic volatility increase uncertainty and discourage investment, E. Udoh and F. Egwaikhide (2008). Fluctuating exchange rates, as an example, have several disadvantages. First, if price elasticity are low, exchange rate depreciation effects could be perverse. Second, it is usually associated with uncertainty and exchange rate risks. Third, fluctuations in the exchange rate can result in significant reduction in the value of assets invested in the host country as well as future profits generated by the investment. Lastly, speculation on the future course of exchange rate movements can be destabilizing hence, imposing losses in economic efficiency and inducing potentially avoidable capital flights.

In addition to the foregoing, a number of theories have been developed to explain the degree of impact of uncertainty (as brought about by macroeconomic volatility) on foreign investment. We have earlier identified factors which have been widely discussed in different literatures as key determinants of foreign investment. These determinants can be grouped into two broad categories. These are; the ‘push factors’ and the ‘pull factors’, Udoh, E. and Egwaikhide, F. (2008).

The push factor theory attributes the direction of capital flows to what happens on the international front; such as fall in international interest rates, business cycles in industrial countries and a rise in international diversification, Calvo and Reinhert (1998) and Calvo et al, (1996).

The pull factors, on the other hand trace the cause of capital flows to domestic factors. These include factors such as; autonomous increase in domestic money demand and increases in the domestic productivity of capital, Hague et al (1997), improvement in external creditor relations, adoption of sound fiscal and monetary policies and neighbourhood externalities. Among other domestic factors, macroeconomic performance, the investment environment, infrastructure and resources and the quality of institutions are paramount.

This study will focus on the pull factors, as this is where exchange rate falls. Volatile exchange rates make international trade and investment decisions more difficult because volatility increases exchange rate risk. Exchange rate risk refers to the potential to lose money because of a change in the exchange rate.

In line with the foregoing, we look at the ‘Risk Aversion Theory’ and its application to the present study. Risk aversion is a concept in psychology, economics, and finance, based on the behaviour of humans (e.g. investors) whilst exposed to uncertainty—Wikipedia: www.wikipedia.com/riskaversion. When individuals select assets, an important factor in their decision is the riskiness of each asset’s return. Other things equal, people dislike risk. Risk aversion is the reluctance of a person to accept a bargain with an uncertain pay-off rather than another bargain with more certain, but possibly lower expected pay-off. If people are risk averse, they value a collection (or portfolio) of assets not only on the basis of its expected return, but also on the basis of the riskiness of that return. Under risk aversion, for example, people may be willing to hold bonds denominated in several different currencies, even if the interest rates they offer are not linked by the interest parity condition, if the resulting portfolio of assets offers a desirable combination of return and risk, Krugman, P. R. and Obstfeld, M. (2006). In general, a
No clear consensus exists in the existing literature on the effects of exchange rate volatility on foreign investment. Results have been varied over time. However, justification for a negative impact of exchange rate volatility on foreign investment can be found in the irreversibility literature pioneered by Dixit and Pindyck. A foreign direct investment in a country with a higher degree of exchange rate volatility will have a riskier stream of profits, all else being equal. As long as this investment is partially irreversible, there is some positive value to holding off on it to acquire more information. Given that there are a finite number of potential direct investments; countries with a high degree of currency risk will lose out on foreign investment to countries with more stable currencies, Foad (2005).

Production Flexibility and Risk Aversion Arguments

In another vein, Osinubi, T. and Amaghionyeodiwe, L. A. (2009) noted in their work that the theoretical arguments linking volatility to foreign investment have been divided between Production Flexibility Arguments and Risk Aversion Arguments. According to production flexibility arguments, exchange rate volatility increases foreign investment because firms can adjust the use of one of their variable factors following the realization of nominal or real shocks. The production flexibility argument relies on the assumption that firms can adjust variable factors, for the argument would not hold if factors were fixed.

According to the risk aversion theory, foreign investment decreases as exchange rate volatility increases. This is because higher volatility in the exchange rate lowers the certainty equivalent expected exchange rate. Certainty equivalent levels are used in the expected profit functions of firms that make investment decisions today in order to realize profits in future periods, Goldberg and Kolstad (1995). Campa (1993) extends this claim to include risk-neutral firms by using the argument of future expected profits. He pointed out that as investors are concerned with future expected profits, firms will postpone their decision to enter as the exchange rate becomes more volatile. Risk neutral firms will thus be deterred from entering foreign markets in the presence of high levels of exchange rate uncertainty. However, Goldberg and Kolstad (1995) still went on to note that when evaluating risk-aversion approaches versus production flexibility approaches it is important to distinguish between short-term exchange rate volatility and long-term misalignments. According to Jayaratnam (2003), risk-aversion arguments hold true and are more convincing under short-term volatility because factors of production are usually fixed, and as a result firms will only be risk-averse to volatility in their future profits. On the other hand, the production flexibility argument appears more convincing under the long-term misalignments because firms are now able to adjust their use of variable factors.

2.3 EMPIRICAL LITERATURE

Assessing the effects of exchange rate volatility on inward foreign direct investment in emerging markets, Chege (2009) stated that there is a wide presumption that volatility in exchange rate of developed countries is one of the main sources of economic instability around the world. The impact of the global economy on emerging countries (like Nigeria) is driven significantly by swings among the currencies of the major economic power, of rather the swings among the most traded currencies which include US (dollar), European Union (Euro) and Japan (Yen) – The G3. These G3 authorities intervene on a totally unplanned basis, without any clear sense of equilibrium. The interventions however usually come too late to prevent severe currency misalignments. According to Allaire (1999), these imbalances cause major economic distortions, protectionist trade pressures and inevitable sharp currency reversals that in turn cause additional large costs. These costs also affect the amount of inward FDI into emerging economies. FDI is considered one of the most stable components of capital flow to developing and emerging markets and can also be a vehicle for technological progress through the use and dissemination of improved production techniques. FDI is now a very large share of capital formation in poorer countries; the FDI-promoting effect of good institutions might be an important channel of their overall effect on growth and development, Agnes et al (2005). It is therefore not out of place to conclude that since foreign investment plays such an important role in the development of emerging economies, it is thus important to maintain a stable flow of inward foreign investment.
to these countries (Nigeria inclusive) and control any factors (like exchange rate) that cause disruption of the process.

In their study of "Exchange Rate Volatility, Inflation Uncertainty and Foreign Direct Investment in Nigeria, E. Udoh and F. Egwaikhide (2008) employed the use of time series data covering the period between 1970 and 2005, in estimating their model. A GARCH model analysis of exchange rate volatility and inflation uncertainty revealed that these two variable exerted significant negative effect on foreign investment during the period. In addition, the results show that infrastructural development, appropriate size of the government sector and international competitiveness are crucial determinants of FDI inflow to the Nigerian economy. Their findings thus support the commitment of policymakers to exchange rate and macroeconomic stability as key to foreign investment boom in Nigeria. Buttressing this point, S. O. Adeleke (2009) in his work on the impact of exchange rate on foreign private investment in Nigeria, discovered after estimation that exchange rate is the most important variable that affects private foreign investment in Nigeria, compared to other macroeconomic variables. Using the Augmented Dickey-Fuller (ADF) unit root test statistic to check the stationarity of exchange rate and other variables, the study recommended that exchange rate be made more market responsive, inflation rate be pursued to a single digit while other generous incentives be put in place to further attract foreign investment.

Conducting a study on the empirical evidence of the effect of exchange rate volatility on foreign direct investment in Nigeria, using secondary time series data from 1970 to 2004, Osinubi, T. and Amaghioyeodiwe, L. A. (2009) suggest, among others, that exchange rate volatility need not be a source of worry by foreign investors. Using the error correction model as well as the Ordinary Least Squares (OLS) method of estimation, the study further reveals a significant positive relationship between real inward FDI and exchange rate. This implies that, depreciation of the Naira increases real inward FDI. Also, the results indicate that the Structural Adjustment Programme (SAP) introduced in 1986, had a negative impact on real inward FDI, which could be due to the deregulation that was accompanied by exchange rate volatility. As such, a major challenge before the Central Bank of Nigeria therefore is to attain a stable and realistic exchange rate that will boost domestic production, increase real inward foreign investment and maintain internal and external balance.

Finally, building on the need for long-term capital inflows in developing countries, Benassy, Q. A.et al (2001) in their paper titled; "Exchange rate strategies in the competition for attracting foreign direct investment", reconsidered the choice of an exchange rate regime by integrating the determinants of MNEs locations. The trade-off between price competitiveness and a stable nominal exchange rate was modeled and the empirical results showed that exchange rate volatility is detrimental to foreign direct investment, and that its impact compares with that of misalignments.

2.4 LIMITATIONS OF PREVIOUS STUDIES

Exchange rate as determining factor of foreign investment (especially FDI) is rigorously studied by different researchers. These studies considered exchange rate from different angles and findings are varied. A case study on Ghana, Kyereboah, C. and Agyire, T., (2008) on the volatility of real exchange rate sowed that the volatility of real exchange rate has a negative influence on FDI inflow. Empirical investigation of firm level data on the US FDI to Korea (Jeon and Rhee, 2008) proves that FDI inflows have significant association with real exchange rate and expected exchange rate changes. Other studies too, Ramirez (2006) and Cushman (1985) show significant relationship between the two variables. Contrary findings on the relationship between the two economic variables are also documented, studies like, Brahmasrene and Jiranyakul, (2001) and Dewenter (1995) state that there is no statistically significant relationship between the level of exchange rate and foreign investment.

Having assessed key empirical findings from different researchers on the issue under discussion, this study intends to identify the missing link which had overtime resulted in the divergent conclusions from researchers. Based on the Nigerian experience, the study will include key macroeconomic variables that would help ascertain the true relationship and impact of exchange on foreign investment.
2.5 HYPOTHESIS OF THE STUDY
Deducing from the objectives outlined for the purpose of this study, the following
hypothesis are proffered to guide the study;

- **H₀ (Null Hypothesis)**: That Exchange Rate instability has no significant impact on Foreign
  Private Investment inflow to Nigeria.

- **H₁ (Alternative Hypothesis)**: That Exchange Rate instability has significant impact on Foreign
  Private Investment inflow to Nigeria.

3.1 DATA ANALYSIS/IMPORTANCE
The data set for this study is comprised of Exchange Rate, inflation Rate, Interest Rate
and Gross domestic Product. An analysis of their importance towards the outcome of this study
is presented below.

**Exchange Rate**
Bamidele et al (1998); The basic objective of Nigeria’s exchange rate policy has been to
ensure both internal and external balance as well as overall macroeconomic stability through the
preservation of the value of the domestic currency, maintenance of favourable external reserves
and price stability.
Iyoha (1998), noted that for a developing country like Nigeria that is highly dependent on trade,
exchange rate plays a significant role in the ability of the economy to attain its optimal
productive capacity.

**Interest Rates**
Interest rates can have a substantial influence on the rate and pattern of economic growth
by influencing the volume and productivity disposition of savings as well as the volume and
productivity of investment. The Keynesian investment theory as well as the Mckinnon and Shaw
savings and investment hypothesis informs the theoretical basis for the use interest rate policy in
stimulating investment. The Keynesian theory implies that low interest rate as a component of
cost of funds encourages borrowing for investment. Mckinnon and Shaw, on the other hand, view
administered low interest rates as detrimental to increased savings and hence investment demand.

**Inflation Rate**
According to Akpokodje (1998); in Tobin-Mundell Model, a high rate of inflation lowers
the real interest rate, thereby moving portfolio adjustments away from real money balances
towards real capital. Thus a high rate of inflation is expected to include higher real investment.
But in Nigeria where the capital and financial markets are large underdeveloped, the
Tobin-Mundell effect does not apply. Instead, a high rate of inflation in Nigeria lowers private
investment. Furthermore, a high rate of inflation in Nigeria is an indication that government lacks
the ability to manage the economy (Akpokodje, 1998), therefore, high rates of inflation are
expected to lead to a contraction of private investment.

**Gross Domestic Product**
Mankiw (1994); GDP equals;
- the total income of everyone in the economy, and
- the total expenditure on the economy’s output of goods and services.
GDP is a gauge of economic of economic performance because it measures something people care
about – their incomes. Similarly, an economy with a large output of goods and services can better
satisfy the demands of households, firms and the government.

**INDICATORS:**
- CFDI – Cumulative Foreign Private Investment
- INT – Interest Rate
- EXR – Rea Exchange Rate
- GDP – Gross Domestic Product
- INF – Inflation Rate
3.2 THE MODEL

Arising from the theoretical and empirical literature, this study, which seeks to examine the impact of exchange rate uncertainty and other key macroeconomic variables on the inward flow of foreign investment to Nigeria will adopt and use the following model for analysis:

\[ CFPI = f(EXR, INF, INT, GDP) \]

Where:

- \( CFPI \) - Cumulative Foreign Private Investment
- \( EXR \) - Real Exchange Rate
- \( INF \) - Inflation Rate
- \( INT \) - Interest Rate
- \( GDP \) - Real Gross Domestic Product

\( CFPI \) is the Dependent Variable, while \( EXR, INF, INT \) and \( GDP \) are Independent Variables.

The above Model can be expressed in estimation form as follows:

\[ CFPI = B_0 + B_1EXR + B_2INF + B_3INT + B_4GDP + e_t \]

Where:

- \( B_0 \) - Autonomous (Intercept)
- \( B_1 \) - Coefficient of \( EXR \)
- \( B_2 \) - Coefficient of \( INF \)
- \( B_3 \) - Coefficient of \( INT \)
- \( B_4 \) - Coefficient of \( GDP \)
- \( e_t \) - Sample Residual or Stochastic Error Term.

3.3 METHOD OF DATA PROCESSING

The regression will be analyzed using the following criteria

(i) **Economic Criteria** – This has to do with the a priori expectation of the coefficients of the parameters in the model, that they conform to basic Economic Theory

E.g.:

\[ CFPI = f (EXR, INF, INT, GDP) \]
\[ \frac{dCFPI}{dEXR} > 0 \]

\[ \frac{dCFPI}{dINF} > 0 \]

\[ \frac{dCFPI}{dINT} > 0 \]

\[ \frac{dCFPI}{dGDP} > 0 \]

(ii) **Econometric Analysis**: This study will employ a Co-integration, Error Correction Model (ECM). The theory of co-integration arises out of the need to integrate short-run dynamics with long-run equilibrium. In cases where the data series exhibit the presence of unit roots, short-run dynamic properties of the model can only be captured in an error correct model when the existence of co-integration has been demonstrated. If \( Y_t \) and \( X_t \) are found to be co-integrated, then there must exist an associated error-Correction Mechanism (ECM), according to Engle and Granger (1987).
The E-VIEWS 3.1 statistical package will be used for the analysis of the model.

4.1 DISCUSSION OF EMPIRICAL RESULT
To empirically ascertain the attempt to study the relationship between Exchange Rate (exr) and foreign private investment the researcher subjected the data collected to Unit Root, Cointegration, and Error Correction tests. The ADF test is used to test whether the variables are non stationary (unit root).

Unit Root Test
The Augmented Dickey-Fuller (ADF) and Philip Perron (PP) formulae were employed to test for stationarity or the existence of unit roots in the data. The test results are as presented below:

<table>
<thead>
<tr>
<th>Series</th>
<th>ADF Statistic</th>
<th>Test Statistic</th>
<th>5% critical values</th>
<th>10% critical values</th>
<th>Order</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFPI</td>
<td>-9.057447</td>
<td>-3.6591</td>
<td>-3.2677</td>
<td>1(2)</td>
<td>Stationary</td>
<td></td>
</tr>
<tr>
<td>EXR</td>
<td>-6.965657</td>
<td>-3.6591</td>
<td>-3.2677</td>
<td>1(2)</td>
<td>Stationary</td>
<td></td>
</tr>
<tr>
<td>INF</td>
<td>-6.210568</td>
<td>-3.6591</td>
<td>-3.2677</td>
<td>1(2)</td>
<td>Stationary</td>
<td></td>
</tr>
<tr>
<td>INT</td>
<td>-6.453729</td>
<td>-3.6591</td>
<td>-3.2677</td>
<td>1(2)</td>
<td>Stationary</td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td>-6.052987</td>
<td>-3.6591</td>
<td>-3.2677</td>
<td>1(2)</td>
<td>Stationary</td>
<td></td>
</tr>
</tbody>
</table>

The above empirical test shows that CFPI, EXR, INF, INT and GDP are integrated of order two. They are integrated of the same order; 1(2). From the above tables, it was found that both ADF and PP Test with trend and intercept indicated that time series are integrated of the same order. The linear combination of series integrated of the same order are said to be cointegrated. The level of their integrations indicates the number of time series have to be differenced before their stationarity is induced. Considering the ADF and PP test statistics at 5% and10% critical values, it is observed that test statistics are greater than the critical values. Thus, the series are said to be stationary at that level.

Cointegration Test
There is a long run relationship between the CFPI and the explanatory variables; EXR, INF, INT and GDP. Firstly, the summary of the Johansen Cointegration Test is shown in the Table below. The model with lag 1 was chosen with the linear deterministic test assumption.

<table>
<thead>
<tr>
<th>Eigenvalue</th>
<th>Likelihood Ratio</th>
<th>5 percent critical value</th>
<th>1 percent critical value</th>
<th>Hypothesized No. of CE(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.995377</td>
<td>228.8486</td>
<td>68.52</td>
<td>76.07</td>
<td>None **</td>
</tr>
<tr>
<td>0.938615</td>
<td>132.0675</td>
<td>47.21</td>
<td>54.46</td>
<td>At most 1 **</td>
</tr>
<tr>
<td>0.914983</td>
<td>81.83676</td>
<td>29.68</td>
<td>35.65</td>
<td>At most 2 **</td>
</tr>
<tr>
<td>0.721616</td>
<td>37.46855</td>
<td>15.41</td>
<td>20.04</td>
<td>At most 3 **</td>
</tr>
<tr>
<td>0.551942</td>
<td>14.45100</td>
<td>3.76</td>
<td>6.65</td>
<td>At most 4 **</td>
</tr>
</tbody>
</table>

(*(**) denotes rejection of the hypothesis at 5% significance Level)
L.R test indicates 5 cointegrating equation(s) at 5% significance.
Normalized Cointegrating Coefficients: 1 cointegrating Equation(s)

<table>
<thead>
<tr>
<th>D(CFPI,2)</th>
<th>D(EXR,2)</th>
<th>D(INF,2)</th>
<th>D(INT,2)</th>
<th>D(GDP,2)</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000000</td>
<td>-7030.6</td>
<td>1734.4</td>
<td>2878.9</td>
<td>-0.2395</td>
<td></td>
</tr>
<tr>
<td>(935.7)</td>
<td>(43.10)</td>
<td>(4758.5)</td>
<td>(1.062)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Under the Johansen Cointegration Test, there are five cointegrated vectors. In Johansen’s Method, the eigenvalue statistic is used to determine whether cointegrated variables exist. The Likelihood Ratio is higher than 5% critical value and the eigenvalues are found as 0.995377, 0.938615, 0.914983, 0.721616 and 0.551942. The Likelihood Ratio of CFPI, EXR, INF, INT and GDP are greater than the critical values at both 5% and 1% level of significance. Also, their Eigenvalues are significantly greater than zero. In other words, the null hypothesis of no cointegration among the variables is rejected in at least four equations. The test result shows the existence of a long-run equilibrium relationship in five cointegrating equations at 5% significance level.

The normalized cointegrating coefficients for one cointegrating equation given by the long-run relationship is

\[
CFPI = -6892.4 - 7030.6EXR + 1734.4INF + 2878.9INT - 0.2395GDP
\]

where CFPI is the dependent variable, -6892.4 is constant, -7030.6 is the coefficient of Exchange Rate (EXR), 1734.4 is the coefficient of Inflation Rate (INF), 2879 is the coefficient of Interest rate (INT) while 0.2395 is the coefficient of GDP.

From the above equation, the constant value is -6892.4 indicating that the foreign private investment in Nigeria is approximately decreasing by N6,892.4k when other variables are zero. The sign of the constant value is negative which means that the proportion in foreign private investment tends to decrease, keeping other variables constant in the long-run. It is found that an increase in EXR on the average will lead to decrease CFPI. However, if the cost of commodity increases, foreign private investment will also increase. This is justified on the ground that suppliers or producers to tend to increase supplies when the price increase. The sign borne by the coefficient of interest rate (INT) is positive. This means even when interest rate increases, foreign private investment will appreciate. Well, the end-point of this will result to burden of cost which will be shifted to final consumers.

In any case, the existence of a long-run cointegrating equilibrium also provides for short-term fluctuations. In order to straighten out or absolve these fluctuations, an attempt was made to apply the Error Correction Mechanism (ECM).

**ERROR CORRECTION MECHANISM (ECM)**

As noted, the ECM is meant to tie the short-run dynamics of the cointegrating equations to their long-run static dispositions. Below is the ECM test for the given data:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>58159.61</td>
<td>111303.7</td>
<td>0.522531</td>
<td>0.6085</td>
</tr>
<tr>
<td>D(EXR)</td>
<td>301.5084</td>
<td>4461.643</td>
<td>0.067578</td>
<td>0.9470</td>
</tr>
<tr>
<td>D(INF)</td>
<td>-336.4275</td>
<td>3325.847</td>
<td>-0.101155</td>
<td>0.9207</td>
</tr>
<tr>
<td>D(INT)</td>
<td>-32659.67</td>
<td>39854.41</td>
<td>-0.819474</td>
<td>0.4246</td>
</tr>
<tr>
<td>D(GDP)</td>
<td>-2.048564</td>
<td>3.789773</td>
<td>-0.540550</td>
<td>0.5963</td>
</tr>
<tr>
<td>ECM(-1)</td>
<td>-1.201669</td>
<td>0.252476</td>
<td>-4.759535</td>
<td>0.0002</td>
</tr>
</tbody>
</table>

R-squared 0.655338 Mean dependent var 17751.29
Adjusted R-squared 0.547631 S.D. dependent var 451489.6
S.E. of regression 303664.7 Akaike info criterion 28.31224
Sum squared resid 1.000000 Schwarz criterion 28.60979
Log likelihood -305.4346 F-statistic 6.084451
Durbin-Watson stat 2.150407 Prob(F-statistic) 0.002435
In order to absolve the short-run dynamics of the relationships, the Error Correction Mechanism holds that a negative error correction coefficient is a necessary condition in the model in this case, the error correction coefficient is \(-1.201669\). This means that the system corrects its previous period disequilibrium at a speed of 120.2\% annually. Moreover, the sign of error correction coefficient is negative and significant indicating the validity of long-run equilibrium relationship between CFPI and the explanatory variables (EXR, INF, INT and GDP). Furthermore, it is concluded that the Error Correction Model (ECM) is not a spurious model as the computed $R^2$ value of 0.655338 is lower than 2.150 (Durbin Watson Statistics). $d^* > d_u$ showing that there is no evidence of autocorrelation in the CFPI function. Nevertheless, EXR, INF, INT and GDP accounts for about 66 percent variation of CFPI in Nigeria.

5.1 Conclusion
The important conclusion from this study is that Exchange Rate instability has significant impact on Foreign Private Investment inflow to Nigeria. This is consistent with most of the findings in the empirical literature. Therefore the benefits derivable from cumulative foreign private investment are good but they neither substitute for the aids of official development assistance flows (Aremu, 1997). Thus, a high inflow of CFPI would lead to rise in gross domestic investment (which will, in turn, lead to growth). More future research is needed to study the impact of foreign private investment (FPI) on capital formation, how the technology of foreign investment and multinational corporations makes domestic firms efficient or inefficient and to ascertain the external effects on the productivity and performance of domestic firms.

5.2 Recommendations
In the light of the research findings, the following recommendations are made:

- Government should adopt other macroeconomic variable which will encourage investment to come in. This can be done by fine tuning monetary policy to make interest rate attractive for both savings mobilization and investment. This can be achieved by making sure that neither the interest rate, inflation rate nor the spread is too high.
- Government should invest in productive sector of the economy and minimize expenditure on things that do not add to the productive capacity of the economy.
- Capital investments in infrastructure are the key to economic growth because this would help reduce cost of investment and production. The idea of not funding important public projects and privatizing should be discouraged because the economy is not ripe for such harsh policies.
- Efforts should be geared by government to reduce exchange rate distortions and or misalignment, increase export of locally manufactured goods and raw materials in a bid to raise value of the local currency, the naira; earn more foreign exchange and allow market forces to properly fix exchange rate. This policy thrust will most likely result into increased capital formation in Nigeria needed for our real sector investments and industrial growth.

Reference:
Chenery, H. and Bruno (1962) "Development Alternatives in an Open Economy: The Case of Israel", Economic Journal, 72
Hayashi, F. (1982) "Tobin's Marginal Q, and Average Q: A Neoclassical Integration", Econometrica Vol. 50,