Investigating the Nexus among Natural Resources, Foreign Direct Investment and Capital Flight in Nigeria: The Role of Institutional Quality

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Abstract
The study investigated the nexus among natural resources, foreign direct investment and capital flight in Nigeria and role of institutional quality in this relationship. Annual time series data from 1986 to 2022 were used for the investigation. The study utilized the Structural Vector Autoregressive model for the analysis. Finding of the study indicated that, natural resources exerts strong positive impact on foreign direct investment in Nigeria and foreign direct investment exerts positive impact on capital flight in the country. Also, the study concluded that, weak institutional quality spur capital flight in the country and strong institutional quality reduces capital flight in the economy. On the basis of the findings of the study, the following recommendations are made: Government should intensify efforts to create an enabling environment for profitable investment and offer foreign investors attractive incentives that can attract and retain foreign investment in the country. This can be done by ensuring that all the component of ease of doing business as stipulated by the World Bank such as: Starting a business; dealing with construction permits; getting electricity; registering property; getting credit; protecting minority investors; paying taxes; trading across borders; enforcing contracts and resolving insolvency are strictly adhered to in the country in dealing with foreign investors.
The National Assembly should urgently make laws that regulate business operations in the country that enhance accountability, transparency, administrative efficiency and adherence to the rule of law to improve the Nigerian institutions. This can be done through reform implementation, capacity building. And good governance mechanisms, while reducing political unrest and insecurity in the country among others.

Keywords: Capital Flight, Foreign Direct Investment, Institutional Quality, Natural Resources, Structural Vector Autoregressive

Introduction

Economic literature has established intricate link among natural resources, Foreign Direct Investment (FDI) and capital flight. Theoretical and empirical evidences have shown that, countries with high natural resources attract higher FDI inflows (Fajrian, Achsani & Widyastutik; 2023 and Shinwari, Zakeri, Usman & Sadiq; 2023). Also, countries with natural resources experience high episodes of capital flight. FDI may provide resources (foreign exchange) that could be siphoned out of resource-rich countries especially in the oil and gas sector through illicit channels that remain unrecorded in the countries' balance of payments. This would be a case of FDI-fueled capital flight. Also, ex-ante capital flight could be the true motive of FDI, in which case, the host country serves as mere transit for unrecorded financial outflows, especially those destined to secrecy jurisdictions. This would be the case for capital flight-bound FDI (Ndikumana & Sarr; 2016).

Also, empirical literature has provided substantial evidence that capital flight is partly fueled by inflows of external capital in the form of FDI (Ezu & Oyanefu; 2023 and Mwangi, Niuguna & Achoki; 2019). The relationship between natural resources and FDI could be either positive or negative. Two factors may explain or motivate a positive relationship between the two phenomena. First, in many

developing countries, natural resource exploitation is dominated by multinational corporations (MNCs). This is especially the case in Africa where foreign ownership of resource exploitation companies is much higher than in other developing regions. The dominance of MNCs in resource exploitation is due to the high capital costs required for investment in the sector, the high technological intensity and high associated risk, which discourage the less capitalized domestic investors. Under these circumstances, a positive relationship between natural resource endowment and FDI is expected. Secondly, in countries where the natural resource sector accounts for a large share of the national economy, it is most likely that, regardless of ownership structure, a large share of private capital inflows will be directed to extractive industries, yielding a positive correlation between FDI and natural resources (Ndikumana & Sarr; 2016).

On the other hand, the relationship between natural resources and FDI may be negative. There are two possible reasons. First, a natural resource export boom may cause a depreciation of the national currency, which discourages export-oriented FDI (Ajayi and Ndikumana; 2015). Second, at the sectoral level, an increase in FDI in extractive industries can discourage investment in other sectors, which may result in a decline in overall FDI in the economy.

In this relationship, institutional quality has a role to play, bad institutions discourage investment in natural resources by profit maximizing firms. On the other hand, bad institutions create opportunities for rent seeking by MNCs through bribery of local rulers, resulting in high resource-seeking FDI in resource-rich countries (Ndikumana & Sarr; 2016). Institutional quality of a rich-resource country is very vital in nature of the relationship between natural resources and FDI. According to Chiyaba and Singleton (2023), FDI inflows tend to exploit countries with rich natural resources when such economies have weak or poor institutional frameworks. Here, rulers of natural resources countries can especially take advantage of weak institutions to disadvantage the growth of other sectors endowed with natural resources. Also, corruption can create barriers to entry of new foreign investors by increasing the cost attached to FDI. Most resource-rich countries are typically dependent on a single sector or resources, which is also the dominant destination of FDI. This makes the MNCs undermine the prevailing quality of domestic institutions and any prospects of improving them through lobbying and exerting undue pressure on policy makers in government. In resource-rich countries with strong institutional qualities, it is difficult for the MNCs to undermine the existing institutions by lobbying policy makers to the disadvantage of the national economy.

With respect to the nexus between FDI and capital flight in an economy, two conceptual frameworks can be drawn regarding the relationship. These are: the investment climate as a determinant of investment decisions; and discriminatory treatment as a determinant of investment decisions. Under the investment climate perspective, capital flight is driven by the risk-adjusted return differential between domestic and foreign assets. Under this view, capital flight would be a signal of higher returns to investment abroad relative to the home country. That is, the investment climate cannot explain simultaneous capital flight and FDI. If domestic assets are dominated by external assets in rate of return, this should be so for both domestic and foreign investors. In fact, the investment climate perspective would suggest a negative relationship between FDI and capital flight: a good investment climate would attract FDI while discouraging capital flight. That is, it would encourage both domestic investment and FDI. Under the discriminatory treatment perspective, capital flight is explained by government laws and regulations that are biased in favour of foreign investment (Ajayi & Ndikumana; 2015). These may include preferential taxation such as tax holidays, investment or exchange rate guarantees, and priority given to foreign claims over resident claims in the event of a financial crisis (Kant, 1996). Such preferential treatments would result in differential perceived or actual risk for domestic investment relative to FDI, which would induce capital flight. Under these circumstances, high capital flight would coexist with high FDI (Ndikumana & Sarr; 2016). This again suggests the potency of institutional quality in regulating the relationship between foreign direct investment and capital flight in an economy.

Poor institutional quality, characterized by unregulated institutions, high corruption levels, and inadequately protected property rights, poses a threat to investments by limiting enterprises' operational capabilities, risk diversification, and dispute resolution. Investors, therefore, must evaluate transaction costs to gauge the overall business environment, with the host country's efforts to reduce these costs instilling trust and making it an attractive destination for FDI. Conversely, good and strong institutional quality is instrumental in reducing transaction costs associated with operations, logistics, production, research and development, and risk monitoring. This helps to attract FDI (Padmaja, Narayam & Puma; 2024).

Furthermore, poor and weak quality of institutions may encourage capital flight through FDI in an economy especially in oil-rich economies. According to Ndikumana and Sarr (2016), African countries that are endowed with oil and gas have experienced highest level of capital flight in recent times through the activities of FDI. They explained that, FDI in the oil and gas sector can contributed to capital flight in several ways. First, the MNCs operating in oil and gas sector repatriate their profits to homes countries leading to an outflow of capital from oil-rich economies. This is commonly the case if such countries have weak and poor institutional regulations. Second, MNCs operating in the oil and gas sectors of oil-rich countries receive their dividend payments in foreign currencies; this contributes to the outflow of capital from the oil-rich countries. Third, corruption and illicit activities in the oil and gas sector can lead to illicit financial flows, as funds are laundered and transferred out of oil-rich countries especially when the institutional frameworks in such countries are weak. Fourth, the MNCs may not reinvest their profits in the oil-rich countries, instead they repatriate such profits contributing to capital flight. This again, depends largely on the institutional frameworks governing the operations of such companies. Finally, foreign oil companies often import equipment, services and expertise leading to foreign exchange outflows. This is effected through over-invoicing and trade faking. This adversely affect foreign exchange management of oil-rich countries. All these fuel capital flight from oil-rich countries and the extent of the effect depends on the nature of the institutional quality in the country in question (Ndikumana & Sarr; 2016).

Nigeria is among countries in Africa with a wide variety of different natural resources. The country is richly endowed with natural resources ranging from oil, industrial metals to various precious stones such as Barites, Gypsum, Kaolin and Marble. Most of these minerals are yet to be exploited. According to OPEC's report (2023), Nigeria is the third largest producer of oil and gas in Africa and the country ranks 11th out of 20 countries with largest oil reserves in the world.

At the same time, Nigeria is the third host economy for FDI in Africa, behind Egypt and Ethiopia. The country is among the most promising poles of growth in the continent and attracts numerous investors in the sector of hydrocarbon, energy, construction, etc. According to UNCTAD's (2022) World Investment Report, FDI flows to Nigeria totaled USD 4.8 billion in 2021, more than doubling from the previous year (USD 2.3 billion in 2020) and well above the pre-pandemic level. In the same year, the total stock of FDI was estimated at USD 91.8 billion, around 20.8% of the country's GDP. The main sectors attracting FDI inflows into Nigeria include oil and gas (by far the largest recipient), telecommunications, manufacturing, real estate, and agriculture.

According to the estimates of Boyce and Ndikumana (2012), Nigeria was ranked first out of 33 African countries in capital flight from 1970 to 2010. Also, the estimates from the Conference on Trade and Development of the United Nations (2018) revealed that, about $88.6 billion per year flees the African continent through capital flight with Nigeria accounting for an estimated 46 per cent of the total capital flight or $40.7 billion per year leaving the African continent through capital flight.

Thus, the phenomenon of capital flight from a capital-starved country like Nigeria which is in dire need of foreign capital to augment domestic capital shortages is a vivid illustration of the Lucas paradox (Lucas, 1990). This continues to be a theoretical and empirical puzzle while also constituting a major concern from a development policy standpoint. It is therefore, worth investigating the linkages among these phenomena in Nigeria. Also, bearing in mind that, resource-rich countries like Nigeria are vulnerable to capital flight. Therefore, the aim of this study is to investigate the nexus among natural resources, foreign direct investment and capital flight in Nigeria and role of institutional quality in this relations.

Theoretical Framework

The study is anchored on the eclectic theory of FDI and the portfolio choice theory of capital flight.

The Eclectic Theory of FDI

The eclectic theory is associated with John Dunning (1981). The theory is a synthesis of foreign trade and foreign investment theories to form a single theory of international economic investment. This theory describes FDI as a non-zero sum game being it the most profitable form of investment for some oligopolistic industries and at the same time, serving as a tool of economic progress of the host counties in LDCs. The theory postulates that, specific factors of both the investing foreign firm and the host country are necessary for a firm's foreign investment and for the firm to have positive contribution to economic growth of the host country. The thrust of this theory states that, on the side of the firm, it must have "firm specific or ownership advantage" that is, the firm must have both tangible and intangible assets which may hardly be available to other firms to enable the investing firm have competitive advantage in global markets. The investing foreign firm may also have "internationalization advantage". This advantage enables an investing foreign firm to use its firm specific or ownership advantage rather than licenses them. The second advantage gives room for wholly foreign owned and controlled enterprises, joint ventures, and others.

On the side of the host country, Dunning maintained that, it must have "location specific advantages". This embraces availability of natural resources, minimum infrastructure, good macroeconomic policies, among others. The above factors of both the investing foreign firm and the host country induce MNCs to locate part of their production facilities abroad to achieve their primary objective and auxiliary motive which are profit maximization and social responsibility.

One of the implications of this theory is that, when firms invest abroad and make profits, they use part of the profits to finance development projects in their host communities to maintain a stable social system around their operations in those communities thereby enhancing economic progress of the host communities.

The implication or relevance of this theory to Nigerian economy is that, the availability of natural resources in Nigeria must be backed up by good or consistent government policies, improvement of infrastructure and human capital, among other things for the country to serve as attractive site for foreign firms with ownership advantage and for the firms to have positive contribution to economic growth of the country.

Portfolio Choice Model of Capital Flight

This model explains the portfolio behaviour of wealth holders in an economy. Sheets (1995) presents the portfolio model as applicable to the capital flight decision of wealth holders. According to this model, capital flight arises from portfolio diversification incentives, return differential incentives and relative risk incentive. In one of the first theoretical models, Khan and Haque (1985) showed that two-way capital flows, private capital flight occurring simultaneously with private foreign borrowing, can arise in a model where domestic and foreign investors face an asymmetric risk of expropriation, so they invest with foreign funds. Dooley (1988) also focused on the notion that domestic and foreign investors face asymmetric risk, but broaden the source of risk to the wide rapid inflation or exchange rate depreciation. A fiscal shock may lead the government to increased reliance on the inflation tax, which erodes the value of domestic financial assets and leads residents to acquire foreign assets. Foreign investors could be attracted by the fall in prices, as domestic residents liquidate their domestic securities. Foreigners face less risk because they are often able to get claims dominated in foreign currency, and these have explicit or implicit government guarantees.

Easton (1987), maintains that the expectation of increased tax obligations created by the potential nationalisation of private debt generates capital flight. In his simple model, private borrowers can invest their own and borrow funds abroad, where they earn less than domestic projects. But the

borrower escapes the obligation to repay the loan or pay taxes. Potential nationalisation of private debt implies that the flight of capital of any one borrower increases the tax obligation of remaining borrowers. In one equilibrium, borrowers invest domestically and loans are repaid, while in another there is capital flight and default on foreign loans. Eaton and Gersovitz (1989) analysed a similar type of capital flight contagion generated by anticipated tax obligations when the government borrows abroad to finance public goods. In a macroeconomic model, Ize and Ortiz (1987) also showed that when fiscal rigidities create difficulties for servicing foreign debt, private capital flight is encouraged by foreign borrowing since there is an expectation of higher domestic asset taxation in order to service future debt.

Capital flight in Schineller's (1993) model is subject to a similar type of contagion, but is not related to foreign debt. Returns to the domestic asset are stochastic because of political risk. Government taxes domestic returns in order to finance a given expenditure requirement, and so the per capita tax rate is endogenous, and depends on the number of investors who do not flee to the foreign asset. When transaction costs to changing the investment position are added, there is a range of inaction where capital flight will not be repatriated, even though the expected domestic returns are favourable.

Another type of capital flight model has explored why domestic agents face high and uncertain risks of explicit and implicit taxation of domestic assets. Alesina and Tabellini (1989) considered a model in which different government types with conflicting distributional goals randomly alternate in office. The uncertainty over future fiscal policies leads simultaneously to capital flight, low domestic investment, and the occurrence of large external debts. The over-borrowing occurs since the current government does not fully internalise the future costs of servicing the debt. In Velasco and Tornell's model (1992), the government is the clearing home of interests of various groups, and confiscatory policies are the outcome of the interest group game. If different groups have the ability to extract transfers from government each group effectively has common access to other capital stocks. Capital flight offers an asset that may have a lower return, but its return can be privately appropriated.

The Standard Portfolio model suggests two key incentives for capital flight, after tax domestic returns adjusted for expected depreciation that are lower than after tax foreign returns, and domestic returns that have higher volatility or risk than foreign returns. The theoretical models point out that one of the most important determinants of the expected future asset tax rate is the level of foreign debt.

Second, the portfolio models have pointed to the importance of contagion or spill-over in capital flight. Empirically, these models imply that in the portfolio decision of an individual investor, the expected after-tax returns on domestic investment would depend on the expected aggregate level of capital flight (or alternatively the available domestic capital base subject to taxation). One implication for aggregate capital flight portfolio shares is that the determinants of capital flight may have different effects when the capital flight share is small compared to when it is large. This reflects the spill-over notion that as capital flight increases, the incentives for further flight increase.

Third, foreign assets are much more liquid than domestic physical capital or claims on domestic physical capital. A model that considered the liquidity of alternative assets would imply that return differentials should be augmented by a liquidity premium. In addition, if domestic investment is more irreversible, then continuing to hold foreign assets even when domestic returns have become more favourable can be optimal due to the "option to wait" for future news about domestic returns.

Thus, capital flight arises from portfolio diversification incentives, return differential incentives and relative risk incentives. Arising from these determinants, a simple portfolio model of capital flight from Sheets (1995) may be derived as follows: consider an agent who maximizes a Constant Relative Aversion (CRA) utility function $U(\bar{W}_t, \delta_p^2)$. The agent invests a share of wealth in the domestic asset which has expected return $\bar{r}$ and variance δ^2, and share (1-a) in the foreign asset which has expected return $\bar{r}_f$ and variance δ_f^2. Covariance between the two assets is δ_{12}.

End of period wealth is:

$$\bar{W}_t = (\alpha \left(1 + \bar{r}\right) + (1 - \alpha)\left(1 + \bar{r}_f\right)\right) w_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2.7$$

The variance of the portfolio is:

$$\delta_{\mathrm{p}} = \alpha^2\delta^2 + (1-\alpha)^2\delta_f^2 + 2\alpha\,(1-\alpha)\delta_{12}) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 2.8$$

The agent's optimization problem can be solved to yield the demand function for the domestic asset:

$$D_{1t} = \left[\frac{\delta_f^2 - \delta_{12}}{\delta_p^2} + \frac{\bar{r} - \bar{r}_f}{\theta\delta_p^2}\right] W_t \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 2.9$$

Where θ is the coefficient of relative risk aversion. Demand for the home asset increases linearly with wealth, decreases with risk aversion and increases as with the differential between the domestic interest and world interest rate.

If the expected return and variance of the domestic asset were equal to that of the foreign asset, the agent would diversify in each asset, $\overline{D}_t$. When the expected returns and variances of the assets differ, then it can express the home asset as follows (using a first-order Taylor expansion around the foreign expected return and variance) :

$$D_{1t} = \overline{D}_t \left[1 + \frac{1}{\delta_f^2 - \delta_{12}}\left(\frac{(\bar{r} - \bar{r}_f)}{\theta} - \frac{1}{2}(\delta^2 - \delta_f^2)\right)\right] \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 2.10$$

This expression highlights two channels which reduce demand for the home asset and increase demand for the foreign asset. These are the types of factors that lead to capital flight. First, in the theoretical review, it was identified how conditions of macroeconomic and political instability increase the riskiness of investing domestically relative to holding foreign assets. In the expression above, these effects operate through the third term. Secondly, it was stated that the explicit and implicit asset taxes imposed by the governments lower the expected domestic return relative to the foreign return. These effects operate through the second term.

From the foregoing discussion, foreign assets can be regarded as relatively safe asset, the absolute degree of risk being similar for all asset holders, while the co-variance with domestic asset is usually low. Thus, the proportion of the portfolio is usually low. Therefore, the proportion of the portfolio held abroad, F, will depend upon both the return on domestic assets relative to foreign assets, r, and on their riskiness relative to foreign assets, v:

F =f(r,v).. 2.11

Empirical Literature

Nidhi, Ritu and Naresh (2024) examined the role of the host country's institutional quality and natural resources on Indian outward FDI for the panel of 15 countries over the period of 2001 to 2020. The study used the fixed-effect panel regression model and found that host nations' political stability, voice and accountability, absence of violence or terrorism, rule of law, and control of corruption attract FDI from India. Further, the government's efficacy and regulatory quality do not have a considerable impact on Indian OFDI. The study also found that the natural resources of the host nation play an important role in the international diversification of investments made by Indian investors.

Mahfoudi, Riache and Louail (2024) examined the impact of natural resources and foreign direct investment on economic growth in Algeria during the period 1970-2021 and compare it with the Saudi economy, which is considered the closest economy in terms of natural resources. The study employed the Autoregressive Distributed Lag (ARDL) approach and findings suggested that, natural resources and foreign direct investment on economic growth in Algeria during the period 1970-2021. The positive correlation between resources and economic growth highlights resource extraction's role in Algeria's economic development. It underscores the need for diversification to reduce dependence on commodity markets.

Padmaja, Narayam and Puma (2024) investigated the impact of institutional quality on the level of FDI inflows in the South Asian and Southeast Asian countries over the period 2002–2019. The study

constructed an institutional quality index by using Principal Component Analysis (PCA) on six governance indicators. The Iterated generalized least squares (I-GLS) in the fixed effect model was employed for the estimation of the results. The results showed that the institutional quality index has a positive and significant impact on the FDI inflows in both the regions. This implies that an ideal governance system comprising of low corruption, political stability, absence of violence, voice and accountability, regulatory quality and proper judicial system helps to attract FDI inflows in the South Asian and Southeast Asian countries. It also has positive spillovers to other economic activities such as GDP growth, international trade and financial development that are vital for economic growth and development.

Chiyaba & Singleton (2023) studied a panel of 69 developing countries using dynamic panel model to investigate the relationship between natural resources, foreign direct investment (FDI) and the quality of national institutions, also known as "the rules of the game" from 1970 to 2015. The study found that abundant natural resources lead to weakened institutions as a result of the potential for firms to secure monopoly rents. The study further showed that the effects of FDI inflows on institutional development are not robust enough to control natural resources rents.

Ludovic & Bertelet (2021) in their study used causality test and pool mean group to analysis the causality between natural resources, quality of institutions and foreign direct investment in some selected oil exporting African countries from 1996 to 2017, the study showed that FDI to non-extractive activities are highly sensitive to transparency in the management of natural resources. It was also found that dependence on natural resources determines the quality of institutions.

Jumann & Keong (2018) studied the mediating effect of institutions on the relationship between natural resources and foreign direct investment inflows in Africa, the study made use of data obtained from 46 Sub-Saharan Africa countries cover from 2000 to 2015. The study employed the Generalized method moments estimators and found that, foreign direct investment - Resources curse exists due to natural resources crowd-out of non-natural resource sectors. Also the study showed a significant positive link between foreign direct investment and the interaction variable of institutions and natural resources signify that FDI-Resources curse exist in countries with weak institutions.

Bilali and Choong (2018) examined the mediating effect of institutions on the relationship between natural resources and FDI inflows using the panel data of 46 Sub-Saharan Africa countries over 2000- 2015. The initial results demonstrate that FDI-Resources curse exists because natural resources crowd out non-natural resource sectors. Moreover, significant positive relationship between FDI and the interaction variable of institutions and natural resources signify that FDI-Resources curse exist in countries with weak institutions. The findings of this study are important in Sub-Saharan Africa because they enforce institutions and governance to promote sectoral linkages and build economy diversity towards the agenda 2063.

Ohiaeri (2017) investigated the nature and direction of causality existing among foreign portfolio investments, capital flight and capital market performance in Nigeria using expost-facto and descriptive research designs by utilizing the data set spanning between 1970 and 2014. Data generated are analyzed using Vector Error Correction models and co- integration tests showed a unidirectional causality between capital market performance on one hand and also between foreign portfolio investment and capital flight on the other hand at 5% and 10% levels of significance respectively. The study concluded that there is significant symbiotic connectivity among the examined variables in Nigeria

Fiodendji (2016) employed the dynamic panel model to study the causality between quality of institutions, natural resources and foreign direct investment inflow in Sub-Saharan Africa from 1984 to 2007. The data was obtained from a panel of 30 Sub-Saharan African countries, it was found that Institutional quality promotes FDI in countries where the natural resources are abundant, but has a negative effect on FDI in natural resources intensive countries. Furthermore, it was found that the marginal effect of natural resources on FDI increases with resource abundance while institutional quality remains a factor. Interaction between the two factors is determinant in countries' ability to compete for FDI inflows.

Ndikumana and Sarr (2016) investigated capital flight and foreign direct investment in Africa focusing on the role of natural resource endowment. The study aimed at providing theoretical and empirical insights into the puzzle of simultaneous rise in foreign direct investment (FDI) inflows in Africa and capital flight from the continent over the past decades. The econometric analysis was based on 32 African countries over the period 1970–2013 using dynamic panel data estimation methods. Three important findings emerged from the analysis. First, while there is no robust evidence that capital flight is fueled by annual FDI inflows (there is no equivalent to debt-fueled capital flight), there is a positive relationship between the stock of FDI and capital flight. Second, natural resource endowment is directly related positively to capital flight and resource endowment is associated with a stronger FDI stock–capital flight link, especially in the case of oil. Third, high-quality institutions somehow weaken the link between FDI and capital flight, although they do not completely eliminate the relationship. The results point to potential gains from improvements in institutional quality in African countries through minimizing the contribution of FDI and natural resources to capital flight.

Using a panel of 99 developing countries, Asiedu (2013) studied relationship between foreign direct investment, natural resources and institution from 1984-2011. The study found that natural resources have an adverse effect on FDI and that the FDI-resource curse persists even after controlling for the quality of institutions and other important determinants of FDI.

Ndiaye (2011) examined the determinants of capital flight phenomenon in the Franc Zone for the period of 1970-2005. The study used the Generalized Method of Moment (GMM) on the annual panel data. The results revealed that poor governance and bad institutional quality, external debt, aid and natural resources, revenues are used to finance capital flight. The results also showed that capital flight arises in the presence of macroeconomic instability that occurs in the forms of an increase in inflation, an exchange rate overvaluation, a decline in terms of trade, uncertainties in government consumption, real interest rates and budget deficits. Furthermore, capital flight episodes arise in the context of less developed financial systems, resulting in reduced deposits and credit to the private sector.

Methodology of the Study

The study used annual time series data spanning from 1986 to 2022 using the Structural Vector Autoregressive (SVAR) model for the investigation. The choice of this technique above other competing techniques stems from the fact that, it is the best method for investigating the pass-through effect among macroeconomic variables.

From the institutional knowledge and empirical evidences, the management of the natural resource sector is characterized by high discretionary control by the central government, which yields substantial economic and political power to the policy makers. This weakens mechanisms of control and it undermines accountability of the government vis-`a-vis the public. The fact that natural resources generate high revenues also weakens accountability of the government vis-`a-vis taxpayers and donors. This implies a high risk of embezzlement of government revenue due to corruption and rent-seeking in the management of natural resources.

Also, given the complexity of technological and financial processes involved in natural resource exploitation creates an imbalance of expertise and technical capacity between the governments of resource-rich developing countries and multinational corporations. This creates opportunities for export under invoicing, export smuggling, and other forms of unrecorded outflows of resources from resource-rich countries. Finally, the complexity of multinational corporations with regard to ownership structure and residence facilitates capital flight especially through trade mis-invoicing. The analysis of the linkages between natural resources, FDI and capital flight suggests that institutions in the resource-rich country have a role to play in this relationships in curtailing the extent of capital flight as a result of FDI in the extractive sector.

Thus, the transmission of this nexus is as follows:

$Natural\ Resources \uparrow \rightarrow FDI \uparrow \rightarrow Weak\ Institutions \uparrow \rightarrow Capital\ Flight \uparrow$

The variables have entered into the SVAR model in level form. Thus, to justify specifications of the order of the variables in the model yield the under listed transposed matrix of the form:

$$cafl_t = f\left(nri_{t-1}, fdi_{t-1,} ins_{t-1} cafl_{t-1,} nri_{t,} fdi_{t,} cafl_t\right) \ldots\ldots\ldots\ldots 4.18$$

$$ins_t = f\left(nri_{t-1}, fdi_{t-1,} ins_{t-1} cafl_{t-1,} nri_{t,} fdi_{t,} cafl_t\right) \ldots\ldots\ldots\ldots\ldots 4.19$$

$$fdi_t = f\left(nri_{t-1}, fdi_{t-1,} ins_{t-1} cafl_{t-1,} nri_{t,} ins_{t,} cafl_t\right) \ldots\ldots\ldots\ldots\ldots 4.20$$

$$nri_t = f\left(nri_{t-1}, fdi_{t-1,} ins_{t-1} cafl_{t-1,} fdi_{t,} ins_{t,} capl_t\right) \ldots\ldots\ldots\ldots 4.21$$

Equation 4.18 to 4.21 can be therefore expressed in the overparametarized SVAR(1) system of equations as follows:

$$cafl_t = \phi_{41}^1 nri_{t-1} + \phi_{42}^1 fdi_{t-1} + \phi_{43}^1 ins_{t-1} + \phi_{44}^1 cafl_{t-1} + \phi_{41}^0 nri_t + \phi_{42}^0 fdi_t + \phi_{43}^0 ins_t + \varepsilon_{4t} \ldots\ldots\ldots 4.22$$

$$ins_t = \phi_{31}^1 nri_{t-1} + \phi_{32}^1 fdi_{t-1} + \phi_{33}^1 ins_{t-1} + \phi_{34}^1 cafl + \phi_{31}^0 nri_t + \phi_{32}^0 fdi_t + \phi_{34}^0 cafl_t + \varepsilon_{3t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots 4.23$$

$$fdi_t = \phi_{21}^1 nri_{t-1} + \phi_{22}^1 fdi_{t-1} + \phi_{23}^1 ins_{t-1} + \phi_{24}^1 cafl_{t-1} + \phi_{21}^0 nri_t + \phi_{23}^0 ins_t + \phi_{24}^0 cafl_t + \varepsilon_{2t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots 4.24$$

$$nri_t = \phi_{11}^1 nri_{t-1} + \phi_{12}^1 fdi_{t-1} + \phi_{13}^1 ins_{t-1} + \phi_{14}^1 cafl_{t-1} + \phi_{12}^0 fdi_t + \phi_{13}^0 ins_t + \phi_{14}^0 cafl_t + \varepsilon_{1t} \ldots\ldots\ldots\ldots\ldots\ldots 4.25$$

By collecting like terms of equations 4.22 to 4.25 and presenting in matrix form, we have the following

$$\begin{bmatrix} 1 & -\phi_{12}^0 & -\phi_{13}^0 & -\phi_{14}^0 \\ -\phi_{21}^0 & 1 & -\phi_{23}^0 & -\phi_{24}^0 \\ -\phi_{31}^0 & -\phi_{32}^0 & 1 & -\phi_{34}^0 \\ -\phi_{41}^0 & -\phi_{42}^0 & -\phi_{43}^0 & 1 \end{bmatrix} \begin{bmatrix} cafl_t \\ ins_t \\ fdi_t \\ nri \end{bmatrix} = \begin{bmatrix} \phi_{11}^1 & \phi_{12}^1 & \phi_{13}^1 & \phi_{14}^1 \\ \phi_{21}^1 \ \phi_{14}^0 & \phi_{22}^1 & \phi_{23}^1 & \phi_{24}^1 \\ \phi_{31}^1 & \phi_{32}^1 & \phi_{33}^1 & \phi_{34}^1 \\ \phi_{41}^1 & \phi_{42}^1 & \phi_{43}^1 & \phi_{44}^1 \end{bmatrix} \begin{bmatrix} cafl_{t-1} \\ ins_{t-1} \\ fdi_{t-1} \\ nri_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \end{bmatrix} 4.26$$

A_0 Z_t A_1 Z_{t-1} V_t

Where

A_0 = 4X4 matrix of contemporaneous effects

Z_t = 4X1 column vector matrix of estimable endogenous variables

A_1 = 4X4 matrix of estimable coefficients of the endogenous variables

Z_{t-1} = 4X1 column vector matrix of lagged estimable endogenous variables

V_t = 4X1 column vector matrix of the white noises in the system.

The above model cannot be estimated using SVAR because the number of parameters is more than the number of equations. Since we cannot estimate an overparameterized model, based on economic theory and institutional knowledge, certain restrictions will be imposed on some parameters of the A_0 matrix in order to resolve the problem of identification in SVAR. Following the recursive approach, we can impose restrictions on the upper elements above the matrix diagonal to zero. Thus, $-\phi_{12}^0 = -\phi_{13}^0 = -\phi_{14}^0 = -\phi_{23}^0 = -\phi_{24}^0 = -\phi_{34}^0 = 0$

Therefore, the generic SVAR model can be specified as:

$A_0 Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + ... + A_P Y_{t-P} + \varepsilon_t$ 4.27

$\Rightarrow \quad A_0 Y_t = A_1 Y_{t-1} + \varepsilon_t$ 4.28

Where:

A_0 = matrix of coefficients of contemporaneous effects

Y_t = vector matrix of estimable endogenous variables

A_1 = matrix of coefficients of parameters

Y_{t-1} = vector matrix of lagged endogenous variables

$\varepsilon_t = B\eta_t$ = vector matrix of uncorrelated structural shocks to the system.

With var(ε_{it}) set to unity and A_0 being chosen to capture the contemporaneous interactions among the y_t, along with the standard deviation of the structural shocks in the model. Following the recursive approach, we can impose restrictions on the upper elements above the matrix diagonal to zero. Therefore, restricting A_0 matrix above in the recursive specification yields:

$cafl_t = lags + \varepsilon_{1t}$ 4.29

$ins_t = \emptyset_{12}^0 cafl_t + lags + \varepsilon_{2t}$ 4.30

$fdi_t = \phi_{31}^0 cafl_t + \phi_{32}^0 ins_t + lags + \varepsilon_{3t}$ 4.31

$nri_t = \phi_{41}^0 cafl_t + \phi_{42}^0 ins_t + \phi_{43}^0 fdi_t + lags + \varepsilon_{4t}$ 4.32

Thus, the parsimonious form of equations is specified in a triangular matrix as follows:

$$A_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -\phi_{21}^0 & 1 & 0 & 0 \\ -\phi_{31}^0 & -\phi_{32}^0 & 1 & 0 \\ -\phi_{41}^0 & -\phi_{42}^0 & -\phi_{43}^0 & 1 \end{bmatrix} \begin{bmatrix} cafl_t \\ ins_t \\ fdi_t \\ nri_t \end{bmatrix} = \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \end{bmatrix} \text{.....4.33}$$

From equation (3.20), where $A_0 Z_t = A_1 Z_{t-1} + \varepsilon_t$,

We know that:

$\varepsilon_t = B\eta_t$

And $B = \begin{bmatrix} \sigma_1^2 & 0 & 0 & 0 \\ 0 & \sigma_2^2 & 0 & 0 \\ 0 & 0 & \sigma_3^2 & 0 \\ 0 & 0 & 0 & \sigma_4^2 \end{bmatrix}$ = unit variance, i.e., var(η_t) = 1

Thus;

$$A_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -\phi_{21}^0 & 1 & 0 & 0 \\ -\phi_{31}^0 & -\phi_{32}^0 & 1 & 0 \\ -\phi_{41}^0 & -\phi_{42}^0 & -\phi_{43}^0 & 1 \end{bmatrix} \begin{bmatrix} cafl_t \\ ins_t \\ fdi_t \\ nri_t \end{bmatrix} = \begin{bmatrix} \sigma_1^2 cafl & 0 & 0 & 0 \\ 0 & \sigma_2^2 ins & 0 & 0 \\ 0 & 0 & \sigma_3^2 fdi & 0 \\ 0 & 0 & 0 & \sigma_4^2 nri \end{bmatrix} \begin{bmatrix} u_t{}^{cafl} \\ u_t{}^{ins} \\ u_t{}^{fdi} \\ u_t{}^{nri} \end{bmatrix}$$

Among others, the restriction that shall be used in this work is by making the system recursive. Proposed by Wold (1951), this assumes that A_0 is typically lower triangular and the structural shocks are not correlated. This is a method of identifying the parameters of structural equations. Wold's suggestion reduces the number of unknown parameters to exactly the number estimated in the summative model.

We know that A_0 which is a lower triangular matrix, measures the contemporaneous effects or long run path. This implies that $\text{var}(\varepsilon_{1t}) = \sigma_1^2$, $\text{var}(\varepsilon_{2t}) = \sigma_2^2$, $\text{var}(\varepsilon_{3t}) = \sigma_3^2$ such that $\text{cov}(\varepsilon_{1t}\varepsilon_{2t}\varepsilon_{3t}) = 0$. More so, the zeros at the upper diagonal imply that there must be no serial correlation among the structural shocks in the model. The *B* matrix measures the structural shocks in the SVAR system. More so, the lower triangular matrix of variances of the parameters changes to zeros. Furthermore, it is also set to avoid spillover effects of the shocks on other variables in the model. That is Ω_S and Ω_S is a diagonal matrix.

This implies that our normalized SVAR of the form $A_0 Z_t = A_1 Z_{t-1} + \varepsilon_t$ reduces to $A_0 e_t = B\eta_t$. But we know $B\eta_t = Bu_t$, hence, the baseline line for our estimable SVAR model can be specified in the reduced form as:

$$A_0 e_t = Bu_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4.34$$

In matrix form, we have:

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ -\phi_{21}^0 & 1 & 0 & 0 \\ -\phi_{31}^0 & -\phi_{32}^0 & 1 & 0 \\ -\phi_{41}^0 & -\phi_{42}^0 & -\phi_{43}^0 & 1 \end{bmatrix} \begin{bmatrix} \varepsilon_t{}^{cafl} \\ \varepsilon_t{}^{ins} \\ \varepsilon_t{}^{fdi} \\ \varepsilon_t{}^{nri} \end{bmatrix} = \begin{bmatrix} \sigma_1^2 cafl & 0 & 0 & 0 \\ 0 & \sigma_2^2 ins & 0 & 0 \\ 0 & 0 & \sigma_3^2 fdi & 0 \\ 0 & 0 & 0 & \sigma_4^2 nri \end{bmatrix} \begin{bmatrix} u_t{}^{cafl} \\ u_t{}^{ins} \\ u_t{}^{fdi} \\ u_t{}^{nri} \end{bmatrix}$$

$$A_0 \qquad \varepsilon \quad = \quad B \qquad u_t$$

Where: A_0 = matrix of long run contemporaneous effects

ε_t = column vector matrix of estimable endogenous variables

B = matrix of structural shocks in the model; $\text{var}(\eta_t) = 1$, unit matrix

u_t = column vector matrix of error terms in the model

Thus, the "S" matrix is specified as:

$$\varepsilon_t = \begin{bmatrix} \varepsilon_t{}^{cafl} \\ \varepsilon_t{}^{ins} \\ \varepsilon_t{}^{fdi} \\ \varepsilon_t{}^{nri} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -\phi_{21}^0 & 1 & 0 & 0 \\ -\phi_{31}^0 & -\phi_{32}^0 & 1 & 0 \\ -\phi_{41}^0 & -\phi_{42}^0 & -\phi_{43}^0 & 1 \end{bmatrix} \begin{bmatrix} \sigma_1^2\, cafl & 0 & 0 & 0 \\ 0 & \sigma_2^2\, ins & 0 & 0 \\ 0 & 0 & \sigma_3^2\, fdi & 0 \\ 0 & 0 & 0 & \sigma_4^2\, nri \end{bmatrix} \begin{bmatrix} u_t{}^{cafl} \\ u_t{}^{ins} \\ u_t{}^{fdi} \\ u_t{}^{nri} \end{bmatrix}$$

This represents the initial impact of shocks in the SVAR model. The impulse responses were used to determine the final impact of shocks in the SVAR model.

Empirical Results

Table 1: Descriptive Statistics

	NRI	FDI	CAFL	INST
Mean	8.40	6,24000.00	34792.67	15.12
Median	7.12	1930000.00	9606.81	15.42
Maximum	22.02	2010000.00	97652.12	17.48
Minimum	2.79	84627.28	4971.87	11.07
Std. Dev.	4.23	7250000.00	38501.00	1.51
Skewness	1.00	0.68	0.57	-0.74
Kurtosis	4.07	1.95	1.58	3.26
Jarque-Bera	7.88	4.57	5.13	9.46
Probability	0.42	0.10	0.08	0.18
Observations	37.00	37.00	37.00	37.00

Source: Authors' Computation using E-views 10

Table 1 presents a descriptive statistics of the variables. The index of natural resources intensity, has a mean value of 8.40% with a minimum value of 2.79% and a maximum value of 22.02%. Its Jarque-Bera statistic of 7.88 indicates non-significant deviation from a normal distribution, highlighting its normal behaviour. Also, FDI shows a mean value of $6,24000.00 billion, ranging from $84627.28 billion to $2010000.00 billion, with a Jarque-Bera statistic of 4.57, suggesting a normal distribution. Examining capital flight, it exhibits an average value of $34792.67, fluctuating between $4971.87 and $97652.12. With a Jarque-Bera statistic of 0.08, suggests that there is no significant departure from normality. Institutional quality presents a mean value of 15.12 points with the extreme values ranging from 11.07 points to 17.48 points, with a Jarque-Bera statistic value of 9.46, suggesting a normal distribution. Similarly, interest rate has a mean value of 17.63% with the extreme values ranging from 10.50% to 29.80%, with a Jarque-Bera statistic value of 8.06, suggesting a normal distribution.

To test for the stationarity properties of the series, the ADF and KPSS unit root tests were used and the results are presented in Table 2.

Table 2: Results of Unit Root Tests

Variable	ADF T-Stat	Critical Value 5%	Order of Cointegration	KPSS LM. Stat	Critical Values 5%	Order of Co-integration
NRI	-8.611302	2.948404	I(1)	0.216219	0.463000	I(1)
FDI	-6.294148	-2.948404	I(1)	0.214370	0.463000	I(1)
CAFL	-8.881295	-2.948404	I(1)	0.250455	0.463000	I(1)
INST	-9.036266	-2.948404	I(1)	0.130888	0.463000	I(1)

Source: Authors' Computation using E-views 10

Table 2 shows the unit root tests results of ADF and KPSS for all the series used in this analysis. For both ADF and KPSS results have indicated that all the series are integrated of order one, that is, I(1). This implies that the variables have mean reverting ability. The implication of this, is that, any shock to the variables will fizzle out with the passage of time.

Before the estimating the SVAR that examines the transmission channel of natural resources to capital flight through FDI and institutions in Nigeria, the optimal lag length was estimated and the results presented in Table 3.

Table 3: Optimal Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-226.1174	NA	6.038279	13.14957	13.32732	13.21093
1	-122.0718	178.3638*	0.039746	8.118390	9.007161*	8.425194*
2	-105.0279	25.32241	0.038947*	8.058737*	9.658524	8.610983

Source: Authors' Computation Using E-Views 10

The table showed that, both the results of sequential modified LR test statistic, Schwarz Information Criterion and Hannan-Quinn information criterion showed that Lag 1 is the optimal lag length for the study; while the result of Final Prediction Error and Akaike Information Criterion selected lag 2 as the optimal lag for the study. However, considering the fact that, Schwarz Information Criterion performs better in lagged models, the study used lag 1 for the SVAR model estimation. Given the result of lag length criterion, the Johansen cointegration test was conducted and the results presented in Table 4.

Table 4: Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.750668	92.33436	47.85613	0.0000
At most 1 *	0.571236	45.10940	29.79707	0.0004
At most 2 *	0.308547	16.31652	15.49471	0.0375
At most 3	0.105005	3.771881	3.841466	0.0521

Source: Authors' Computation using E-views 10

The result of the unrestricted rank test (Trace) revealed the existence of 3 cointegrating equations among the series. The null hypothesis of no cointegration among the series was therefore rejected in favour of the alternate hypothesis. This connotes the presence of long-run relationship among the variables. Furthermore, the Maximum-Eigenvalue was estimated and the results are presented in the following table.

Table 5: Unrestricted Cointegration Rank (Maximum –Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.750668	47.22496	27.58434	0.0001
At most 1 *	0.571236	28.79288	21.13162	0.0034
At most 2	0.308547	12.54464	14.26460	0.0918
At most 3	0.105005	3.771881	3.841466	0.0521

Source: Authors' Computation Using E-views 10

The result of Unrestricted Cointegration Rank (Maximum –Eigenvalue) reveals the existence of 2 cointegrating equations among the series. This suggests the presence of long-run relationship among the variables used in the model.

In order to ascertain the transmission mechanism of natural resources to capital flight via FDI inflows and the role of institutional quality in this nexus, the contemporaneous structural parameters were estimated and the results are shown in the Table 6

Table 6: Estimated Contemporaneous Structural Parameters

	CAFL	**INST**	**FDI**	**NRI**
CAFL	1	0	0	0
INST	-4.776973(0.0961)	1	0	0
FDI	1.896860(0.2150)	0.212230(0.0144)	1	0
NRI	-6.274685(0.3305)	-0.274515(0.4783)	2.037384(0.0035)	1

Probability values in Parentheses
Source: Authors' Computation using Eviews 10

The estimated contemporaneous structural parameters have shown that, natural resources have a positive impact on foreign direct investment in the short run and it is statistically significant. This means that, a 1% increase in the contemporaneous impact of natural resources will contemporaneously increase foreign direct investment in the economy 2.04%. This implies that, the availability of natural resources in Nigeria attracts foreign direct investment into the country.

Again, the estimated contemporaneous structural parameters have indicated that, foreign direct investment is positively and statistically significant related with the institutional quality in Nigeria in the short-run. This implies that, a 1% increase in the contemporaneous impact of institutional quality will contemporaneously increase foreign direct investment in the economy 0.21%. This can be ascribed to the fact that, high institutional quality attracts foreign investors into an economy with the confidence that, the safety of their investment is guaranteed.

Finally, the estimated contemporaneous structural parameters indicated that, institutional quality is negatively related with capital flight in Nigeria in the short-run. This means that, a 1% contemporaneous reduction in the institutional quality will contemporaneously lead to 4.7% increase in capital flight in the country. This implies that, weak institutional quality precipitate surge in capital flight; whereas, high institutional quality reduces capital flight in the economy.

Before analyzing the impulse responses and the variance decompositions, the diagnostic tests were performed. First, the VAR residual serial correlation test was conducted and the results presented in Table 7.

Table 7: VAR Residual Serial

Lag	LRE* stat	df	Prob.	Rao F-stat	df
1	22.89072	16	0.1167	1.529222	(16, 58.7)
2	15.29912	16	0.5028	0.961979	(16, 58.7)
Lag	LRE* stat	df	Prob.	Rao F-stat	df
1	22.89072	16	0.1167	1.529222	(16, 58.7)
2	36.43180	32	0.2700	1.173216	(32, 56.9)

Source: Authors' computation using Eviews 10

The table showed the results of VAR residual serial correlation LM test which showed that, both the LRE*stat and Reo F-stat are not statistically significant. This therefore, leads to the conclusion that, there is no serial correlation in the SVAR. That is, successive errors in the SVAR model were not correlated with each other.

Second, the VAR Residual Heteroskedasticity Tests with cross terms was conducted and the results were presented in Table 8.

Table 8: VAR Residual Heteroskedasticity Tests (Includes Cross Terms)

Chi-sq	Df	Prob.
160.8912	160	0.4653

Source: Authors'Computation using Eviews 10

Table 5.16 showed the VAR Residual Heteroskedasticity Tests (Includes Cross Terms) result. From the results, the Chi-square values are not statistically significant, implying that, there is no presence of heteroskedasticity in the SVAR model.

Impulse Response Functions

The Impulse Response Functions (IRF) showed the response of each variable in the system to shocks from the system variables. In order to further buttress how shocks the variables, the impulse response functions were estimated and the results presented in Figure 1.

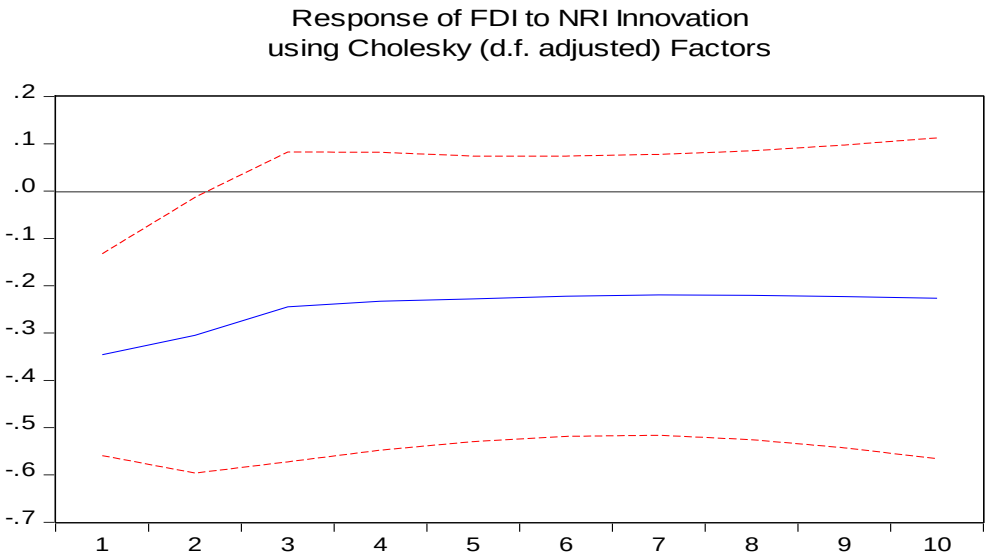

Figure 1: Impulse Response of FDI to Natural Resources

The impulse response function graph of response of FDI to natural resources showed that, foreign direct investment (FDI) responded positively to NRI though within the negative region. The impact appears to be permanent over the forecast horizon.

Furthermore, the impulse response function of the response of FDI to innovations in the institutional quality was estimated and it is presented in Figure

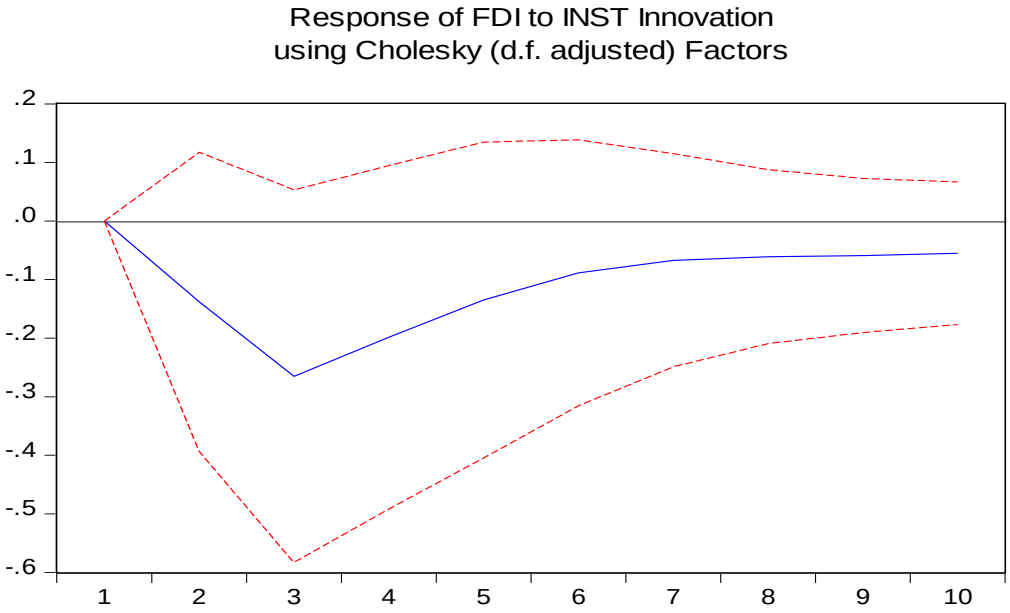

Figure 2: Impulse Response of Foreign Direct Investment to Institutional Quality

The impulse response of FDI inflows to institutional quality reveals that, from the first period to the third period, FDI declined given the innovations in the institutional quality, it assumed an increasing trend throughout the forecast horizon, though within the negative region and the effect appears to transitory.

Again, the impulse response function of institutional quality to capital flight was estimated and presented in Figure 3.

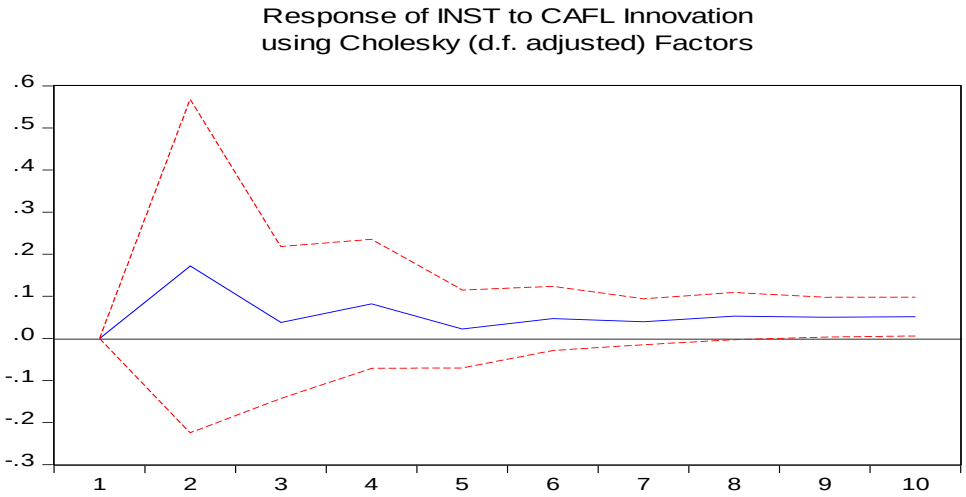

Figure 3: Impulse Response of Institutional Quality to Capital Flight

From Figure 3, it is clear that, impulses from capital flight caused the institutional quality to maintain low and fluctuating trend from the first period up to the fifth period; thereafter, it maintained a stable trend throughout the forecast horizon and the effect appears to be transitory. Furthermore, the impulse response function of capital flight to institutional quality was estimated and presented in Figure 4.

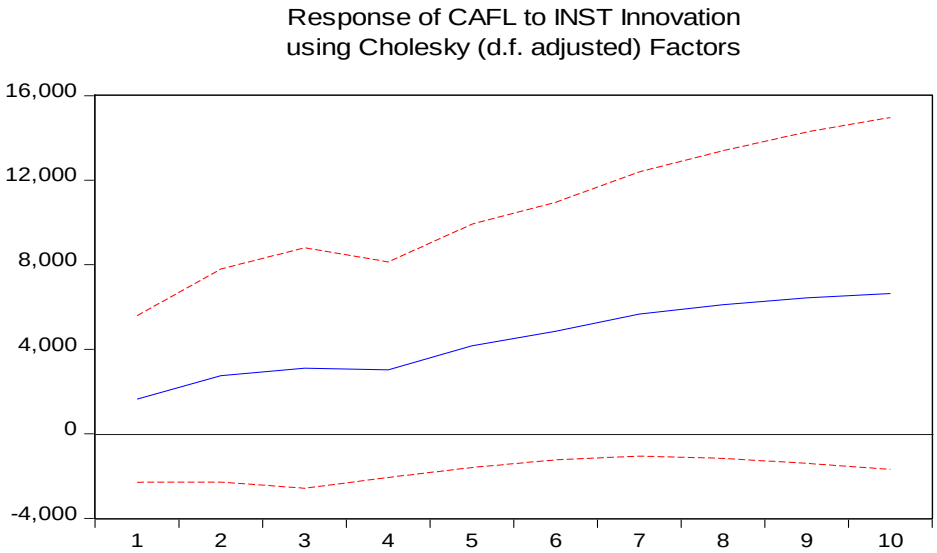

Figure 4: Impulse Response of Capital Flight to Institutional Quality

The impulse response function graph of response of capital flight to natural institutional quality showed that, capital flight has responded positively to innovations in institutional quality throughout the forecast period and the impact appears to be permanent. This suggests that, weak institutional quality in the country precipitates surges in capital flight from Nigeria.

Forecast Error Variance Decomposition

The Forecast Error Variance Decomposition (FEVD) provided information about the proportion of movements in a sequence due to its own shocks and the shocks due to other variables in the system. The FEVD was estimated and the results presented in the following tables. First, the Forecast Error Variance Decomposition of FDI was estimated and presented in Table 10.

Table 10: Variance Decomposition of Foreign Direct Investment

Period	S.E.	NRI	FDI	INST	CAFL
1	0.659214	25.80050	74.19950	0.000000	0.000000
2	0.822348	28.52371	68.66024	2.815644	0.000409
3	0.927328	27.88344	61.43558	10.38326	0.297710
4	0.978109	28.22439	57.68538	13.45505	0.635184
5	1.007188	28.76257	55.73957	14.48535	1.012513
6	1.024915	29.13558	54.78596	14.73157	1.346894
7	1.037569	29.29516	54.26660	14.79308	1.645163
8	1.047050	29.30983	53.90212	14.86494	1.923118
9	1.054167	29.24708	53.57465	14.97889	2.199366
10	1.059408	29.15393	53.26992	15.09974	2.476410

Source: Authors' Computation using Eviews 10

The variance decomposition results revealed that own shocks of foreign direct investment are dominant from the first period to the tenth period. It however, declined from 74.17% from the first period to 53.27% in the tenth period; meaning that, natural resources, Institutional quality and capital flight are the predictors of foreign direct investment. A unit change in natural resources in the first period accounted for about 25.80% in the forecast error variance of foreign direct investment in the first period and the results increased gradually to 29.15% in the tenth period. In a similar way, the shocks of institutional quality accounted for 2.82% in the forecast error variance of foreign direct investment in the second period and the results increased rapidly to 15.09% in the tenth period. Also, a unit change in capital flight accounted for 0.0004% in the forecast error variance of foreign direct investment in the second period and the impact improved gradually to 2.47% in the tenth period. The implication is that, natural resources and institutional quality are strong predictors of foreign direct investment in Nigeria within the study period, and capital flight was found to be the weak predictor of foreign direct investment among the variables.

Again, Forecast Error Variance Decomposition of institutional quality was estimated and presented in Table 11.

Table 11: Variance Decomposition of Institutional Quality

Period	**S.E.**	**NRI**	**FDI**	**INST**	**CAFL**
1	1.228027	5.263679	6.797398	87.93892	0.000000
2	1.281839	6.624097	6.817124	84.76018	1.798602
3	1.300455	8.193273	6.623356	83.35239	1.830982
4	1.313540	9.086236	6.930204	81.79894	2.184617
5	1.325418	9.617623	7.868225	80.34042	2.173728
6	1.337049	9.917478	8.777552	79.04416	2.260815
7	1.345327	10.07756	9.182373	78.42126	2.318807
8	1.351302	10.16719	9.312804	78.06899	2.451017
9	1.354910	10.21843	9.338519	77.86774	2.575312
10	1.357280	10.24508	9.345939	77.69864	2.710346

Source: Authors' Computation using E-views 10

The variance decomposition results revealed that own shocks of institution are dominant from the first period to the tenth period. It however, declined from 87.93% in the first period to 77.69% in the tenth period; meaning that, natural resources, foreign direct investment and capital flight are the predictors of institution. A unit change in natural resources in the first period accounted for about 5.26% in the forecast error variance of institution the first period and the results decreased gradually to 10.24% in the tenth period. For foreign domestic investment, a unit change in institution explained about 6.79% in the forecast error variance of institution in the first period and the results increased significantly to 9.34% in the tenth period. For capital flight a unit change in capital flight accounted for 1.79% in the forecast error variance of in the second period and the impact improved gradually to 2.71% in the tenth period. The implication is that foreign direct investment was the strongest predictors of institutional quality in Nigeria within the study period. Finally, Forecast Error Variance Decomposition of capital flight was estimated and presented in Table 13

Table 13 Variance Decomposition of Capital Flight

Period	S.E.	NRI	FDI	INST	CAFL
1	0.069612	2.545185	0.020102	11.00480	86.42991
2	0.077772	3.651158	1.428392	12.61529	82.30516
3	0.090734	3.739806	1.093774	9.522439	85.64398
4	0.097455	4.335645	1.491176	9.260529	84.91265
5	0.105671	4.722653	1.922145	8.653774	84.70143
6	0.112009	5.366758	2.829754	8.234957	83.56853
7	0.117917	5.911903	3.546990	7.652912	82.88820
8	0.122823	6.500233	4.243324	7.169618	82.08682
9	0.127212	7.040603	4.796425	6.747047	81.41593
10	0.131033	7.562205	5.307322	6.404788	80.72569

Source: Authors' Computation using E-views 10

The variance decomposition results revealed that own shocks of capital flight were dominant from the first period to the tenth period. It declined from 86.42% from the first period to 80.72% in the tenth period; meaning that, natural resources, foreign direct investment and institution are predictors of capital in Nigeria. A unit change in natural resources in the first period accounted for about 2.54% in the forecast error variance of capital flight in the first period and the results increase gradually to 7.56% in the tenth period. For foreign direct investment, a unit change in foreign direct investment explained about 0.02% in the forecast error variance of capital flight in the first period and the results increased gradually to 5.30% in the tenth period. Similarly, a unit change in institution accounted for 11.00% in the forecast error variance of capital flight in the first period and the impact improved significantly to 6.40% in the tenth period. The implication is that; natural resources was the strongest predictors of capital flight in Nigeria.

Conclusion and Policy Recommendations

The study has concluded that, natural resources exerts strong positive impact on foreign direct investment in Nigeria and foreign direct investment exerts positive impact on capital flight in the country. Also, the study concluded that, weak institutional quality spur capital flight in the country and strong institutional quality reduces capital flight in the economy. Based on the findings of this study, the study made the following recommendations:

1. Government should intensify efforts to create an enabling environment for profitable investment and offer foreign investors attractive incentives that can attract and retain foreign investment in the

country. This can be done by ensuring that all the component of ease of doing business as stipulated by the World Bank such as: Starting a business; dealing with construction permits; getting electricity; registering property; getting credit; protecting minority investors; paying taxes; trading across borders; enforcing contracts and resolving insolvency are strictly adhered to in the country in dealing with foreign investors.

2. The National Assembly should urgently make laws that regulate business operations in the country that enhance accountability, transparency, administrative efficiency and adherence to the rule of law to improve the Nigerian institutions. This can be done through reform implementation, capacity building. And good governance mechanisms, while reducing political unrest and insecurity in the country.
3. The judiciary in collaboration with anti-graft agencies in Nigeria should improve on their detective mechanisms to reduce capital flight in the country. This can be done through collaborative efforts with the Nigerian financial institutions and the international financial institutions.

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