# Analysis of Foreign-Aid Capital Flight Transmission Mechanism in Nigeria Using the Corruption Route

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## Abstract

This study analyzed the transmission mechanism of capital flight and foreign aid in Nigeria using the corruption route. The study was anchored on the gaps model of foreign aid and portfolio choice model of capital flight. The *ex-post facto* design and a quantitative technique were employed in which econometric tools were used to analyze the data collected from the secondary sources about the variables from 1986 to 2021. Descriptive statistics were used to describe the properties of the data set, followed by testing for the stationarity properties of the time series used. The Structural Vector Autoregressive (SVAR) model was used to account for the transmission mechanism. The findings of the study revealed that foreign aid responds to capital flight through the corruption route in Nigeria. The study concluded that corruption remains an efficient route for the transmission of foreign aid to capital flight in Nigeria. The study therefore recommended amongst others that the Economic and Financial Crimes Commission (EFCC) and The Independent Corrupt Practices and Other Related Offences Commission (ICPC) should beam their searchlight on foreign aid funds to track corrupt individuals who enrich themselves with the funds that usually transmit to capital flight from Nigeria.

**Keywords:** Corruption Route, Corruption, Capital Flight & Foreign Aid.

## Introduction

Developing countries especially the Sub-Saharan countries have attracted high level of inflows of foreign capital in the past five decades. These inflows are aimed at supplementing the capital shortages these countries are faced with. The inflows of capital from developed countries to developing countries are usually in form of foreign direct investment (FDI), Foreign Portfolio Investment (FPI), and Official Development Assistance (ODA). Official Development Assistance which is also called Foreign Aid is further Sub-divided into tied and untied aid. Foreign aid can involve a transfer of financial resources or commodities such as food military equipment or technical advice and training. The resources can take the form of grant or concessional credit such as export credit (Massa, 2015).

While developing countries have taken advantage of external capital to enhance the inflow of resources, increased acquisition of foreign assets by residents of these countries has continued unabated (Akaani, 2007). This paradoxical situation of capital movement from developing countries to foreign countries amid capital shortages in these developing countries has been an additional motivation behind the interest on the subject matter of capital flight. When capital flees from developing countries to developed countries either for safe havens or for investment, it is termed capital flight. This is so because the conventional neo-classical theories postulate that capital should flow from developed countries to developing countries where there is shortage of capital for investment (Akaani, 2007).

In Nigeria, many studies such as Akaani (2007), Ajilore (2010) and Akighir (2017) have confirmed the existence of substantially larger capital flight in absolute and relative terms than that from other

Sub-Saharan African Countries. Nigeria is placed seventh out of the 20 largest exporters of illicit funds worldwide, with a total figure of $129billion from 2001 to 2010 (Aribisala, 2013). Boyce and Ndikumana (2012), corroborated this when they estimated capital flight in 33 African countries and rated Nigeria first among the top ten countries in capital flight from 1970-2010. Furthermore, the United Nations Conference on Trade and Development (2018) estimated that about $88.6billion per year leave the African continent through capital with Nigeria accounting for an estimated 46 per cent of the total capital flight or $40.7billoin per year.

This seemingly co-movement of foreign aid and capital flight in the country is worrisome. The concurrent flow of capital flight and foreign aid in incompatible path has posed am empirical challenge of whether the inflow of foreign capital itself contributes to the illicit outflow of domestic capital by providing easy access to foreign currency which provides the liquidity to support the flight of capital in Nigeria or otherwise.

Thus, the net effect can only be determined empirically; hence, the need and the imperativeness of this study in the context of the Nigerian economy. This is because Nigeria as a country has been consistently ranked as a corrupt country by the Transparency International. In 2018, corruption perceptions index for Nigeria was 27 score. Though Nigeria corruption perceptions index fluctuated substantially in recent years, it tended to increase through 2004-2018 period ending at 27 score in 2018 which moved Nigeria to 144th from 148th in Transparency International latest corruption index. In 201, Nigeria was rated as 154th least corrupt nation out of 180 countries by Transparency International with 24 score at the end of the 4th quarter in 2021. It is against this background that this study seeks to investigate effect of foreign aid on capital flight in Nigeria and the routes that foreign aid leads to capital flight in Nigeria.

It is against this background that this study seeks to investigate the link between foreign aid and capital flight through corruption route in Nigeria.

## Review of Related Literature
## Conceptual Review

It is pertinent to clearly understand the main concepts under study. The concepts of foreign aid and capital flight as well as the corruption route are therefore elucidated in this section.

## Foreign Aid

Foreign aid has been conceptualized as international transfer of capital, goods, or services from a country or international organization for the benefit of the recipient country or its population (William, 2021). Aid can be economic, military, or emergency humanitarian (e.g., aid given following natural disasters). Foreign aid can be in form of financial resources or commodities (e.g., food or military equipment) or technical advice and training. The resources can take the form of grants or concessional credits (e.g., export credits). The most common type of foreign aid is official development assistance (ODA), which is assistance given to promote development and to combat poverty. The primary source of ODA which for some countries represents only a small portion of their assistance is bilateral grants from one country to another, though some of the aid is in the form of loans, and sometimes the aid is channeled through international organizations and nongovernmental organizations (NGOs). For example, the International Monetary Fund (IMF), the World Bank, and the United Nations Children's Fund (UNICEF) have provided significant amounts of aid to countries and to NGOs involved in assistance activities (William, 2021).

According to Williams (2021), countries often provide foreign aid to enhance their own security. Thus, economic assistance may be used to prevent friendly governments from falling under the influence of unfriendly ones or as payment for the right to establish or use military bases on foreign soil. Foreign aid also may be used to achieve a country's diplomatic goals, enabling it to gain diplomatic recognition, to garner support for its positions in international organizations, or to increase its diplomats' access to foreign officials. Other purposes of foreign aid include promoting a country's exports (e.g., through programs that require the recipient country to use the aid to purchase the donor country's agricultural products or manufactured goods) and spreading its language, culture, or religion. Countries also provide aid to relieve suffering caused by natural or man-made disasters such as famine, disease, and war, to promote economic development, to help establish or strengthen political institutions, and to address a variety of transnational problems including disease, terrorism and other crimes, and destruction of the environment. Because most foreign aid programs are designed to serve several of these purposes simultaneously, it is difficult to identify any one of them as most important (William, 2021).

**Capital Flight**

Capital flight is a phenomenon characterized by large outflows of assets and/or capital from a country due to some events, resulting in negative economic consequences to that country. Additionally, the term can be referred to as the rapid withdrawal of assets and capital (both foreign and domestic capital) from certain regions or cities within a country (Corporate finance institute, 2021)

According to Corporate finance institute (2021), Capital flight can be either legal or illegal. Legal capital flight usually takes the form of repatriation of invested capital by foreign investors. In this case, the capital outflows must be properly reported according to existing accounting standards and comply with the country's laws. Conversely, illegal capital flight generally appears in the form of illicit financial flows (IFFS). Essentially, illicit financial flows disappear from records within a country and do not return to the country. Note that illegal capital outflows are mostly associated with countries that impose strict capital control policies.

Ndikumana and Boyce (2002) explained capital flight as residents' capital outflows, excluding recorded investment abroad. According to Cooper and Hardt (2000) capital flight flow of financial assets resulting from the holder's perception that capital is subjected to inordinate level of risk due to devaluation, hyperinflation, political turmoil or expropriation of retained earnings at home in domestic currencies. This implies that the owner of funds in the hostile environment is seeking a safe haven for the fund. Walter (1987) defines capital flight as 'capital which flees' involving international asset redeployments or portfolio adjustments due to significant perceived deterioration in risk-return profiles associated with assets located in a particular country. Although the legality or illegality of the activity might be debatable, the key issue is that there is a conflict between the objectives of asset holders and society (Hermes & Lensink, 2001).

**Corruption Route**

Probably the most widely accepted link from aid to capital flight is via corruption. The hypothesis depends upon two steps: aid increases corruption, and corruptly acquired assets are more likely to be placed abroad.   Spectacular and credible instances of aid being diverted by corrupt politicians into Swiss bank accounts have supported a more generalized critique of the effects of aid on governance. It is well-attested that the origins of accountable government came from the demands of tax-payers for the scrutiny of how their money was used. Since aid reduces the need for taxation

it is feared that it thereby reduces the pressure by the electorate for accountability. In addition to this highly generalized link to weakened governance, aid may directly create opportunities for public sector corruption through high expenditures on procurement. Using global data, Knack and Keefer (2001) indeed finds some statistical evidence that aid is associated with increased corruption. In turn, corruption may increase capital flight. Corruptly acquired money may be held more securely abroad than retained within the country. This can be thought of in terms of the risk-corrected rate of return. Corruptly acquired assets have distinctive risk properties, being as safe as honestly acquired assets when held outside the country but being riskier than honestly acquired assets while held domestically. Again there are spectacular instances of corruptly acquired money being held abroad – for example, the estimated $4bn of former Head of State, General Sani Abacha of Nigeria. Because of the combination of its direct implications for morality and the media attention given to supporting instances, it attracts passionate support. It is therefore important to recognize its limitations. First, the route depends upon two links – from aid to corruption, and from corruption to capital flight – neither of which may be correct beyond the level of the anecdote. The effect of aid on corruption can be contested: donors currently exert considerable pressure on governments to reduce corruption.

## Theoretical Review

Two theories: the gaps model of foreign aid and portfolio choice model of capital flight are reviewed in this section.

## Gaps Model of foreign Aid

The gaps model was developed by Chenery and Strout in 1966 to strengthen the Harrod-Domar model's argument about the role of foreign aid in the increase of physical capital accumulation. Harrrod-Domar model concluded that foreign aid assists in filling the saving gap in developing countries. Chenery and Strout further argued in the Two-gap model that apart from saving gap, there are foreign exchange gap that hinder the developing countries to import capital goods for economic growth. Thus, they argued that, foreign aid provides funds to the developing countries for the importations of capital goods. Furthermore, Chenery and Strout (1996) added the third gap model. The model argued that, there is scarcity of technological advancement and marginal skills that can be used efficient in production in developing countries. Thus, they called it human capital gap. On the basis of these gaps, Chenery and Strout (1996), maintained that the inflow of foreign aid from developed countries to developing countries immensely assists developing countries to supplement their capital shortages for enhanced production. They argued that all capital inflows facilitate and accelerate growth by removing foreign exchange and domestic savings gags; as such, constitute net additions to a developing country's productive resources thus increasing its growth.

With passage of time, Edmar Bacha in 1990) and Lance Taylor in 1994 extended the two-gap model and introduced the three-gap model and added the fiscal deficit gap (Broner, Didier, Erce & Schmukler, 2013). They stressed that the main source of growth challenge of developing countries is the government budget constraint rather than the foreign exchange constraints and savings gap. This fiscal gap has to do with the gap between government revenues and expenditures which tends to inhibit the growth strides of developing countries. Thus, foreign capital inflows are necessary in filling these gaps and promoting growth in developing countries.

## 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.

Easton and Thomson (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.

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 Rodrik (1994) 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.

**Theoretical Linkage**

The Chenery and Strout gaps model and the portfolio choice model of capital flight are adequate in explaining the dynamics of foreign aid and capital flight in the context of the Nigerian economy. The gaps model has sufficiently explained the dire need of foreign capital in the Nigerian economy to enable the economy address fiscal rigidities. These interventions enter the economy in form of aid and debts. Consequent upon their inflows into the Nigerian, such aids are first diverted into private assets since aid reduces government taxes, people do not necessarily demand for accountability of such aid inflows. When such monies are corruptly converted into private assets, these unscrupulous wealth holders begin to seek safe heavens by way of diversifying their portfolios by investing abroad and domestically. They do this because of fear of the government confiscating that illicit wealth and partly because of conditions of macroeconomic and political instability that increase the riskiness of investing domestically relative to holding foreign assets. Their investment of the illicit wealth abroad is further predicated upon the premise that foreign assets are much more liquid than domestic physical capital or claims on domestic physical capital. Thus, flight of illicit capital in Nigeria arises from portfolio diversification incentives, return differential incentives and relative risk incentive as postulated by the portfolio choice model of capital flight.

**Empirical Review**

Several studies have been reviewed relative to this study to provide enough literature about capital flight and foreign aid to compare findings and strengthen the conclusions about the current findings.

To examine the impact of capital flight on economic growth in Nigeria, Miftahu, (2021) employed annual time series data spanning 1980 to 2019. The data collected were analyzed using the Autoregressive Distributed Lag (ARDL) model to account for the hypotheses. He found that there existed the presence of long-run and short-run relationship between real GDP, capital flight, foreign reserve, external debt, and domestic investment in Nigeria. He also presented that the impact of various coefficients showed a negative and significant impact that capital flight has; while foreign reserve, external debt, and domestic investment showed a positive impact on economic growth in the long-run period. The key recommendation was that government should design feasible economic reform measures to curtail the rising wave of capital flight. This study is relevant and has guided the current research in methodological approach.

In 2021, Okafor and Obiajulu researched on the capital flight. They investigated the relationship between kidnapping rate and capital flight in developing countries. They focused on the period of 2003–2017, linking between kidnapping and capital flight by utilizing a sample of 67 developing countries. They found from GMM technique that kidnapping rate has a positive and significant impact on capital flight. However, estimations of the marginal differences showed that this significant effect remained consistent only in the sample of 'fragile' developing countries. These results are stated to remain consistent to alternative measures of capital flight.

The impact of capital flight on domestic investment in Nigeria was examined by Effiom, Achu and Edet (2020). The researchers employed time series data covering the period of 1980 to 2017. They adopted a methodology of ARDL model and their results showed the presence of long-run relationship among the variables and that capital flight established a negative and significant effect on domestic investment in Nigeria.

Jamal (2019) researched comparatively on the capital displacement effects of Chinese and U.S. foreign aid to developing countries. They applied panel data from the period of 2010 to 2017 with the Bank of International Settlements and overseas development assistance data for the U.S. and China. The large amounts of aid delivered to developing countries are associated with aid leakage in the form of capital flight and the Chinese foreign aid produces more capital flight to offshore financial centers and to Chinese destinations, whereas U.S. foreign aid displaces capital to the U.S. or destinations in the developed West were tested. Their findings indicated that from 2010 onwards, U.S. foreign aid is positively correlated with capital flight back to the United States itself, whereas Chinese foreign aid is correlated with capital flight to offshore financial centers. It was noted that, the findings have policy implications for aid conditionality, corruption, safeguards, and how both countries disburse aid. Commendable efforts were by the researcher, explaining the capital displacement effects of Chinese and U.S. foreign aid to developing countries. However, it is different from the current study in that it is not specifically focused on Nigeria and two; it has not linked aid with capital flight in a typical developing country like Nigeria.

A theoretical and empirical study was carried out by Ndikumana and Sarr (2019) to ascertain the concurrent rise in foreign direct investment inflows in Africa and capital flight using annual data covering the period of 1970 to 2015 from the continent with a sample of 30 African countries. The study found that FDI flows are positively related to capital flight. They concluded that higher FDI inflows lead to higher capital flight within the continent.

Using a panel framework, Osei-Assibey, Domfeh and Danquah (2018) investigate the effect of corruption and institutional governance indicators on capital flight using a portfolio choice framework through the GMM and fixed effect regression on panel data of 32 countries in Sub-Saharan Africa (SSA) over a sample period covering 2000 to 2012. Result shows that high

perception of corruption facilitates an increase in capital outflow from SSA. Implying that, corruption encourages capital flight in the continent thereby retard economic growth in the long-run.

## Gap in Empirical Literature

Generally, there is paucity of empirical literature linking foreign aid and capital flight. The political economy of foreign aid and capital flight has been under researched especially in the context of developing countries like Nigeria who have benefited from foreign aid inflows and at the same time have experienced upsurge in capital flight. The only study to the best of the researcher's knowledge that has attempted this empirical investigation is that of Colliers, Hoeffler and Pattillo (2004) who investigated Aid-capital flight association in forty-eight OECD countries using non-linear estimation (control function approach) and found out that Aid substantially reduces capital flight in the countries investigated. Thus, the novelty of this study stems from the fact that it is the first in the context of the Nigerian economy that aims at investigating the nexus between foreign aid and capital flight with explicit transmission analysis amongst the variables.

## Methodology

The study employed ex-post facto design and a quantitative technique in which econometric tools were used to analyze the data collected from the secondary sources. Descriptive statistics were used to describe the properties of the data set, followed by testing for the stationarity properties of the time series used. The Structural Vector Autoregressive (SVAR) model was used to ascertain the impact and causal relationship between foreign aid and capital flight in Nigeria.

Thus, empirical model for this study is implicitly specified as follows:

$$Aid \rightarrow Copt \rightarrow cafl \ldots \qquad \ldots \qquad \ldots \qquad (3.1)$$

Where $cafl$ is capital flight,

$aid$ is foreign Aid

$copt$ is corruption perception index

The variables in model 3.1 will enter the SVAR model in their level form. Thus, utilizing an SVAR(1) with 3 variables, the model will be expressed in the form:

Thus, to justify specifications of the order of our variables in our model will yield the under listed transposed matrix of the form:

$$cafl_t = f\left(cafl_{t-1}, copt_{t-1}, aid_{t-1}, cafl_t, copt_t, aid_{t,}\right) \ldots \ldots \ldots \ldots \ldots ..3.2$$

$$copt_t = f\left(copt_{t-1}, aid_{t-1}, cafl_{t-1}, copt_t, aid_t, cafl_{t,}\right) \ldots \ldots \ldots \ldots \ 3.3$$

$$aid_t = f\left(aid_{t-1}, copt_{t-1}, cafl_{t-1}, aid_t, copt_t, cafl_{t,}\right) \ldots \ldots \ldots \ldots \ldots 3.4$$

Thus, the exposition of the normalized SVAR (1) system of equations will yield:

$$cafl_t = \beta_{11}^1 cafl_{t-1} + \beta_{12}^1 copt_{t-1} + \beta_{13}^1 aid_{t-1} + \beta_{11}^0 cafl_t + \beta_{12}^0 copt_t + \beta_{13}^0 aid_t + \varepsilon_{1t} \ldots \ldots 3.5$$

$$copt_t = \beta_{21}^1 copt_{t-1} + \beta_{22}^1 aid_{t-1} + \beta_{23}^1 calf_{t-1} + \beta_{21}^0 copt_t + \beta_{22}^0 aid_t + \beta_{23}^0 calf_t + \varepsilon_{2t} \ldots .3.6$$

$$aid_t = \beta_{31}^1 aid_{t-1} + \beta_{32}^1 copt_{t-1} + \beta_{33}^1 cafl_{t-1} + \beta_{31}^0 aid_t + \beta_{32}^0 copt_t + \beta_{33}^0 calf_t + \varepsilon_{3t} \ldots \ldots 3.7$$

Collecting the contemporaneous effects to the left hand side (LHS) yields and presenting in a matrix form, the over-parameterized SVAR model is specified as:

$$\begin{bmatrix} 1 & -\beta_{12}^0 & -\beta_{13}^0 \\ -\beta_{21}^0 & 1 & -\beta_{23}^0 \\ -\beta_{31}^0 & -\beta_{32}^0 & 1 \end{bmatrix} \begin{bmatrix} cafl_t \\ copt_t \\ aid_t \end{bmatrix} = \begin{bmatrix} \beta_{11}^1 & \beta_{12}^1 & \beta_{13}^1 \\ \beta_{21}^1 & \beta_{22}^1 & \beta_{23}^1 \\ \beta_{31}^1 & \beta_{32}^1 & \beta_{33}^1 \end{bmatrix} \begin{bmatrix} cafl_{t-1} \\ copt_{t-1} \\ aid_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix} \ldots \ldots 3.8$$

Hence, $A_0 Z_t \quad = \quad A_1 Z_{t-1} + \varepsilon_t$ . $\ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots$.3.9

Where:

$A_0 = 3 \times 3$ matrix of contemporaneous effects of endogenous parameters

$Z_t = 3 \times 1$ column vector matrix of estimable endogenous variables

$A_1 = 3 \times 3$ matrix of estimable endogenous variables

$Z_{t-1} = 3 \times 1$ column vector matrix of lagged estimable endogenous variables

$\varepsilon_t = 3 \times 1$ column vector matrix of error terms in the system.

The above model cannot be estimated using SVAR because the number of parameters are more than the number of equations. Since we cannot estimate an over-parameterized 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. In other words, we set $-\beta_{12}^0 = -\beta_{13}^0 = -\beta_{14}^0 = \beta_{23}^0 = \beta_{24}^0 = \beta_{34}^0 = \beta_{35}^0 = 0$.

Therefore, the generic SVAR model can be specified as:

$$A_0 Z_t = A_1 Z_{t-1} + A_2 Z_{t-2} + \ldots + A_P Z_{t-P} + \varepsilon_t \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 3.10$$

$$\Rightarrow A_0 Z_t = A_1 Z_{t-1} + \varepsilon_t \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 3.11$$

Where:

$A_0 =$ matrix of coefficients of contemporaneous effects

$Z_t =$ vector matrix of estimable endogenous variables

$A_1 =$ matrix of coefficients of parameters

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

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

With var $(\varepsilon_{it})$ set to unity and $A_0$ being chosen to capture the contemporaneous interactions among the $\varepsilon_t$, along with the standard deviation of the structural shocks in the model.

Since most macroeconomic variables are recursive in nature, restricting $A_0$ matrix above in the recursive specification yields:

$$cafl_t = lags + \varepsilon_{1t} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 3.12$$
$$copt_t = \beta_{21}^0 cafl_t + lags + \varepsilon_{2t} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 3.13$$
$$aid_t = \beta_{31}^0 copt_t + \beta_{32}^0 cafl_t + lags + \varepsilon_{3t} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 3.14$$

Thus, the parsimonious form of equations $3.12 - 3.14$ is specified in a triangular matrix 3.15

$$A_0 = \begin{bmatrix} 1 & 0 & 0 \\ -\beta_{21}^0 & 1 & 0 \\ -\beta_{31}^0 & -\beta_{32}^0 & 1 \end{bmatrix} \begin{bmatrix} cafl_t \\ copt_t \\ aid_t \end{bmatrix} = \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 3.16$$

$A_0 =$ From our equation (4.18), where $A_0 Z_t = A_1 Z_{t-1} + \varepsilon_t$,

We know that:

$$\varepsilon_t = B\eta_t$$

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

$$A_0 = \begin{bmatrix} 1 & 0 & 0 \\ -\beta_{21}^0 & 1 & 0 \\ -\beta_{31}^0 & -\beta_{32}^0 & 1 \end{bmatrix} \begin{bmatrix} cafl_t \\ copt_t \\ aid_t \end{bmatrix} = \begin{bmatrix} \sigma_1^2 cafl & 0 & 0 \\ 0 & \sigma_2^2 copt & 0 \\ 0 & 0 & \sigma_3^2 aid \end{bmatrix} \begin{bmatrix} u_{cafl} \\ u_{t^{copt}} \\ u_{t^{aid}} \end{bmatrix}$$

One of the restrictions 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 uncorrelated. 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.

More so, $A_0$ which is a lower triangular matrix, measures the contemporaneous effects or long run path. This implies that $\text{var}(\varepsilon_{1t}) = \sigma_1^2$, $\text{var}(\varepsilon_{2t}) = \sigma_2^2$, $\text{var}(\varepsilon_{3t}) = \sigma_3^2$, $\text{var}(\varepsilon_{4t}) = \sigma_4^2$ such that $\text{cov}(\varepsilon_{1t}\varepsilon_{2t}\varepsilon_{3t}\varepsilon_{4t}) = 0$. 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. Note that, 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 $\Omega_S$ and $\Omega_S$ 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 that $B\eta_t = Bu_t$. Hence, the baseline line for our estimable SVAR model can be specified in the reduced form as:

$$A_0 e_t = Bu_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 3.17$$

In matrix form, we have:

$$\begin{bmatrix} 1 & 0 & 0 \\ -\beta_{21}^0 & 1 & 0 \\ -\beta_{31}^0 & -\beta_{32}^0 & 1 \end{bmatrix} \begin{bmatrix} cafl_t \\ copt_t \\ aid_t \end{bmatrix} = \begin{bmatrix} \sigma_1^2 cafl & 0 & 0 & 0 \\ 0 & \sigma_2^2 copt & 0 & 0 \\ 0 & 0 & \sigma_3^2 aid & 0 \end{bmatrix} \begin{bmatrix} u_{t^{cafl}} \\ u_{t^{copt}} \\ u_{t^{aid}} \end{bmatrix}$$

$$A_0 e_t \quad = \quad B \quad u_t$$

Where: $A_0$ = matrix of long run contemporaneous effects

$e_t$ = column vector matrix of errors for the respective variables

$B$ = matrix of structural shocks in the model

$u_t$ = column vector matrix of structural shocks in the model

Hence the "S" matrix is specified as:

$$e_t = A_0 B u_t = \begin{bmatrix} e_{t\,cafl} \\ e_{t\,copt} \\ e_{t\,aid} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ -\beta_{21}^0 & 1 & 0 \\ -\beta_{31}^0 & -\beta_{32}^0 & 1 \end{bmatrix} \begin{bmatrix} u_{t\,cafl} \\ u_{t\,copt} \\ u_{t\,aid} \end{bmatrix}$$

This represents the initial impact of shocks in the SVAR model. The impulse responses will however determine the final impact of shocks in the SVAR model.

Thus, the impact of foreign aid on capital flight in Nigeria can be seen through the following channels.

$-\beta_{21}^0$ is expected to measure the relationship between capital flight and foreign aid.

$-\beta_{31}^0$ is expected to measure the relationship between corruption and capital flight

$-\beta_{32}^0$ is expected to measure the relationship between foreign aid and corruption.

## Result of the Findings

Descriptive analysis, trend analysis and structural VAR analysis results are presented and analyzed in this section.

## Descriptive Statistics

Descriptive statistics such as mean, standard deviation, skewness, kurtosis and Jargue-Bera are used I this study.

## Table 1. Summary of Descriptive Statistics of the Study Variables

| Variable | Mean | Std. Dev. | Skewness | Kurtosis | Jarque Bera | Probability | Obs |
|----------|------|-----------|----------|----------|-------------|-------------|-----|
| AID | 2680104 | 3516580 | 0.829336 | 4.425274 | 6.775343 | 0.0338 | 42 |
| CAFL | 1918.525 | 781.0062 | 0.176529 | 3.047490 | 0.179783 | 0.9140 | 42 |
| COPT | 33.10000 | 15.99166 | -0.817256 | 6.287251 | 19.09333 | 0.0001 | 42 |

*Source: Extract from Results of E-views 9*

Table 1 shows the summary statistics on the variables used in the study for test of normality properties of residuals in the data set. The standard value of Skewness of a symmetric distribution, such as normal distribution is zero. The Skewness values for all the series used in the study are close to zero which suggests that they are Skewness normal. The Kurtosis of a normal distribution is 3. The Kurtosis distribution measures the peakness of a distribution that is usually assumed to be normal. As shown in Table 1, the series values were close to 3 except that of COPT. The divergent of COPT from normally distributed value could be due to extrapolation used in obtaining data on corruption before 1993 when official data were not yet documented as the TI had not started publication of CPI. Nevertheless, the series do not exhibit characteristic of a distribution with a high peak and flat tails called leptokurtic (k>3). They do not also have substantially flat-topped curves and thinner tails called platykurtic (k<3), but they have generally exhibited mesokurtosis (k=3) suggesting a normal distribution.

Jarque – Bera results show that apart from COPT which was significant at 0.01 level, the rest of the series failed to reject the null hypothesis of a normal distribution. It is therefore, clear that the series are subject to distribution that is not different from the normal one.

## Trend Analyses of the Study Variables

This section focuses on the trend analyses of the study variables.
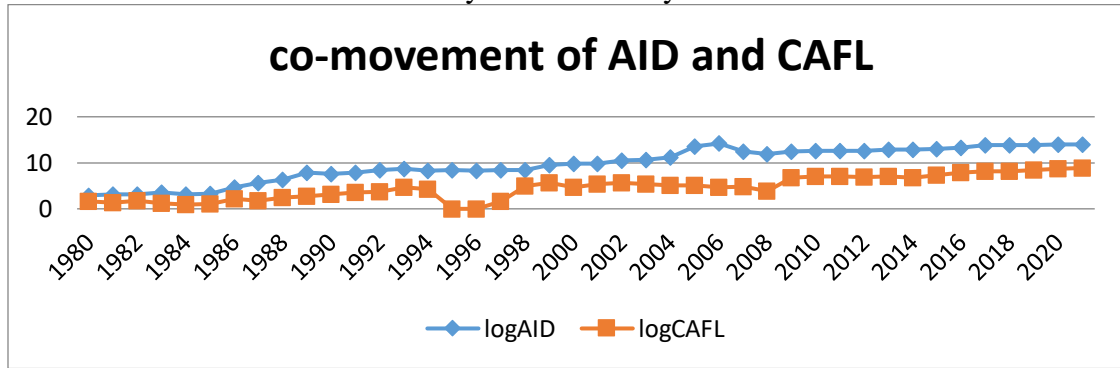


**Figure 1. The co-movement of capital flight and foreign aid**

Figure 1 displays the movement of capital flight alongside foreign aid in Nigeria within the study period. The trend showed an irregular movement of capital flight and foreign aid within the period. However, it was observed that a co-movement existed between the two variables since both of the trended in a perpendicular direction. This posed a paradox since increase in foreign aid was not expected to be accompanied by a corresponding increase in capital flight.

## The Stationarity Test

**Table 2. Stationarity Test Results**

| Variable | ADF | | PP | | KPSS | | Order | Decision |
|---|---|---|---|---|---|---|---|---|
| | t-Statistic | Critical Value @5% | t-statistic | Critical Value @5% | LM-Statistic | Critical Value @5% | | |
| CAFL | -3.644204 | -2.938987 | -3.663353 | -2.935001 | 0.175218 | 0.4630000 | I(1) | Reject $H_0$ |
| AID | 0.291262 | -2.935001 | -3.882722 | -2.935001 | 0.185277 | 0.4630000 | I(1) | Reject $H_0$ |
| COPT | -6.364406 | -2.935001 | -3.663358 | -2.935025 | 0.043361 | 0.4630000 | I(1) | Reject $H_0$ |

*Source: Extract of Author's Computations from E-views 9.*

Results presented in Table 2 show that the series failed to attain stationality at levels. Thus, the series have indicated a uniform order of integration and hence, suitable for the use of Structural Vector Auto-Regressionn (SVAR) Analysis.

## Structural Vector Auto-Regressionn (SVAR) Analysis

### Ordering of Variables and the SVAR Results

The ordering of the variable for estimation with structural VAR followed Cholesky approach depicting the effect of foreign aid on capital flight through the corruption route in Nigeria. The transmission is therefore, depicted as ADT→COPT→CAFLT.

**Table 3. Result of Joansen Co-integration**

| Trace Statistics | Critical Value @ 0.05 | Prob. Value | Max-Eigen Statistics | Critical Value @ 0.05 | Prob. Value |
|---|---|---|---|---|---|
| 37.15351 | 29.79707 | 0.0059 | 25.96977 | 21.13162 | 0.0096 |
| 11.18374 | 15.49471 | 0.2005 | 11.18347 | 14.26460 | 0.1453 |
| 0.000273 | 3.841466 | 0.9889 | 0.000273 | 3.841466 | 0.9889 |

**Source:** *Extract of Author's Computations from E-views 9.*

Result of Johansen Cointegration presented in Table 3 shows that there exists a long run relationship among the variables. Thus, both the Trace and Max-Eigen statistics indicated the existence of one integrating equation in the system. This is because the probability value of one equation was significant at 0.05 level of significance. The existence of long run relationship in the system therefore, renders SVAR model estimation appropriate.

**Table 4. SVAR Lag Order Selection Criteria for SVAR Model using the Corruption Route**

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| 0 | -1058.611 | NA | 8.84e+19 | 54.44159 | 54.56955 | 54.48750 |
| 1 | -957.4406 | 181.5878* | 7.84e+17* | 49.71490* | 50.22677* | 49.89855* |
| 2 | -954.2067 | 5.306942 | 1.06e+18 | 50.01060 | 50.90636 | 50.33199 |
| 3 | -945.2756 | 13.28204 | 1.09e+18 | 50.01414 | 51.29380 | 50.47327 |

*Source: Extract of Author's Computations from E-views 9.*

Table 4 shows that all the information selection criteria: the sequential modified LR test statistic, the Final Prediction Error (FPE), the Akaike's Information Criterion (AIC), the Schwartz Information Criterion (SC) and the Hannan-Quinn, Criterion (HQC) suggested the selection of a maximum lag length of One. One lag length was therefore, selected for the Structural VAR model. The study therefore, selected one lag length in estimating the structural VAR for the corruption route.

**Table 5. Recursive SVAR Result (AID→COPT→CAFL)**

| | CAFL | COPT | AID |
|---|---|---|---|
| CAFL | 1 | | |
| COPT | -0.57 | 1 | |
| AID | 0.17 | -0.06 | 1 |

*Source: Computation by Author from Eviews-10 Output*

The SVAR results in Table 5 present that foreign aid responds negatively to changes in capital flight contemporaneously by 17%. Conversely, corruption indicated a positive transmission effect contemporaneously by 57% due to changes in capital flight in Nigeria. This implies that positive relationship between capital flight and corruption in the country. Results also show that corruption is positively related to foreign aid. A one (1) unit decrease in corruption increase foreign aid by 6%.

It is worthy to note that assets that are acquired by corruption have distinguishing risk properties. This has seemed safety just like honestly acquired assets when kept outside the country but being riskier than honestly acquired assets while kept within the country. For instance, the estimated $4bn of former Head of State, General Sani Abacha of Nigeria can have a combined effect that is direct for morality and the media concern given to supporting instances, it attracts passionate support. The limitations could be recognized; firstly, the route dependence is upon two directions – from aid to corruption, and from corruption to capital flight – neither of which may be correct
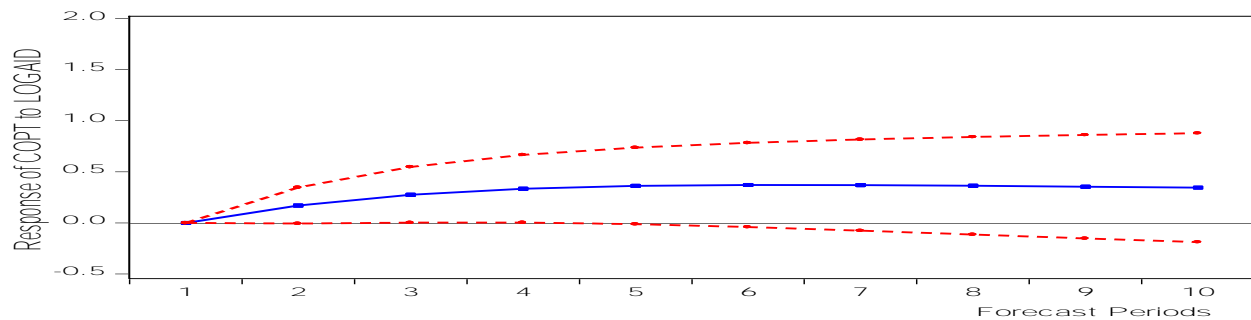
beyond the level of the anecdote. Thus, the postulation that the transmission of foreign aid to capital flight is rooted through corruption is also justified by the estimates.
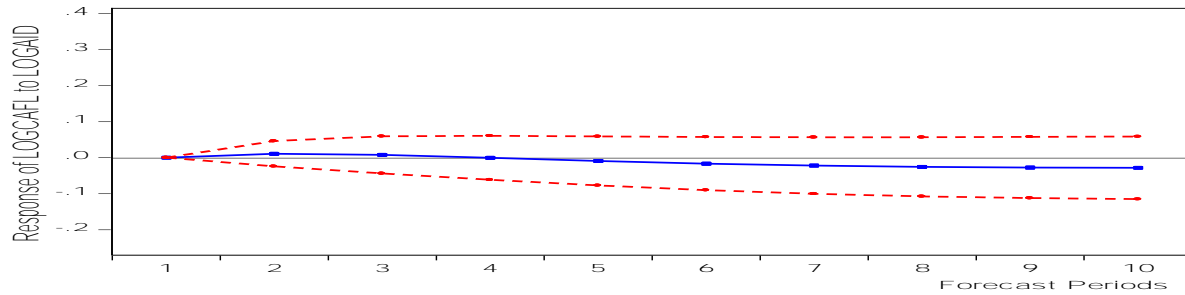
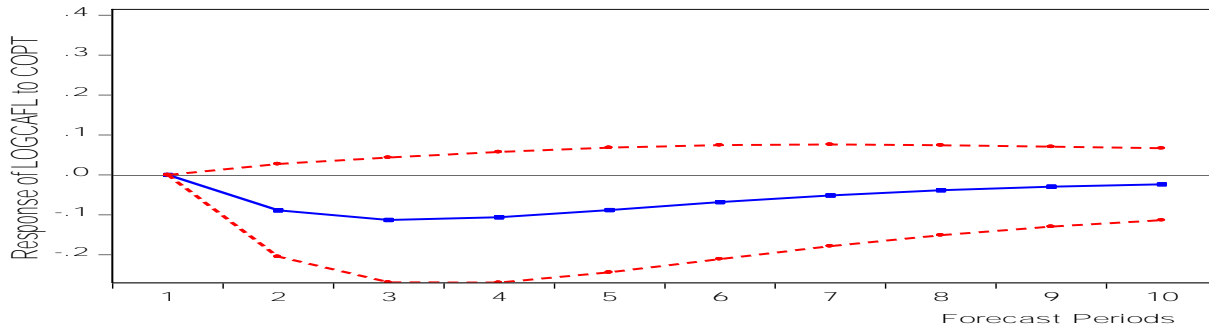**Figure 2. Response of Capital Flight to Innovation in Foreign Aid**

From Figure 2 capital flight would pose a temporal shock as a response to a one SD innovation to foreign aid with positive values in the short run up to the 4th period and would respond negative after the 5th period of the ending short run. Negative response from capital flight would continue steadily from the 6th period to the 10th period in the ending long run with no reverting tendencies temporally. Specifically, only in period 2 and 3 that capital flight experienced positive and significant response in the short run. Period 5 lead a significant negative response through to the last period of the long run permanently. The negative response in the long run would spread away from the equilibrium indicating no reverting response to the positive region. As such, the permanent shock poses no revert to an increase or fall to the positive region if dwindling issues concerning foreign aid in Nigeria are not addressed. This contradicts the postulation that capital flight has a long-term positive response. Thus, this could be a confirmation that efforts made by Nigeria government towards tackling foreign aid led corruption have not met the sufficiency required to yield positive results in the long run. This suggests a negative response of capital flight to innovations in foreign aid and this  relationship is long-lived.

**Figure 3 Response of Corruption to Innovation in Foreign Aid**

Result in Figure 3 shows that a one SD innovation to foreign aid would pose a positive and temporal shock to corruption in the beginning of short run (period one) within the positive region throughout the short run. The positive response was significant and continues steadily to the long run period. From the result, an innovation in foreign aid would  have positive response corruption significantly at the middle of the short term up to the beginning of the long run temporally; this would be consistent to the end of the  long run (the 10th period). This implies that the more innovations in foreign aid, the more corruption cases in the country; this is feasible in Nigeria.

**Source:** Author's Computation from E-views 10 Output

## Figures 4. Response of capital flight to Innovation in Corruption

The impulse response estimates from Figures 4 indicates that a one Standard Deviation (SD) innovation in corruption would initially pose insignificant and negative response from capital flight in the short run. But from period two to four, a significant negative response was displayed temporally to the end the short run. The steady decrease in the negative response will continue in the beginning of the long run from period six up to period eight after which it will maintain a permanent response with little difference in size and value up the long-run ending; approaching the equilibrium. This indicates that in Nigeria, an innovation to corruption presents a negative response from capital flight majorly in the short-run but a better response would emerge in the long-run; a possible recovery with positive response. This is to say that, continues effort to fight against corruption in the country could influence capital flight gradually to positive response especially in a long run.

**Table 6. Forecast Error Variance Decomposition Results of Capital Flight using the Corruption Route**

| Period | S.E. | CAFL | LCOPT | AID |
|--------|------|------|-------|-----|
| 1 | 718.0380 | 100.0000 | 0.000000 | 0.000000 |
| 2 | 784.5452 | 98.70738 | 0.937252 | 0.355366 |
| 3 | 799.0613 | 95.57816 | 4.029091 | 0.392747 |
| 4 | 807.7543 | 93.54082 | 5.963893 | 0.495287 |
| 5 | 809.8244 | 93.08036 | 6.338868 | 0.580775 |
| 6 | 810.4962 | 92.97775 | 6.330623 | 0.691630 |
| 7 | 811.4976 | 92.77881 | 6.399572 | 0.821616 |
| 8 | 812.9623 | 92.45392 | 6.589506 | 0.956571 |
| 9 | 814.6915 | 92.06363 | 6.842181 | 1.094188 |
| 10 | 816.5051 | 91.65525 | 7.110028 | 1.234719 |

*Source: Extract of Author's Computations from E-views 9.*

Table 6 shows that the variance decomposition results reported within a 10 – year horizon shows that neither corruption nor capital flight explained shocks in foreign aid in the first year. In the fifth year, corruption and capital expenditure explained 6.338868 and 0.580775 percentage of changes in foreign aid, respectively. In the 10th period 91.65525 percent changes in capital flight were due to own shocks. Also. 7.110028 percent of the changes were due shocks in corruption while 1.2334719 percent changes in in capital flight was accounted for by foreign aid. This means that the foreign aid constituted a minimal fraction of capital flight in the 10-year forecast period, while corruption explained shock in foreign aid to a larger extent in Nigeria.

**Table 7. Residual Test Results of SVAR Model for the Corruption Route**

| Test Statistics | DF | Probability | Decision |
|---|---|---|---|
| Serial Correlation CHSQ | 2 | 0.0059 | No serial correlation |
| Heteroskedasticity CHSQ | 2 | 0.6699 | Series are homoskedastoc |
| Test of Normality (Jarque-Bera) | 2 | 0.0000 | Normally distriuted |

*Source: Extract of Author's Computations from E-views 9. (*) means significant at 5%*

Result of SVAR test as presented in Table 7 shows that the probability values based on 2 lag selection criteria was significant at 5 per cent level. This implies that the data set is free from serial errors. The heyeroskeasticity result reveals that the series are homoscedastic while normality test indicates that the data used are normally distributed.

**Conclusion**

The study concludes that corruption remains an efficient route for the transmission of foreign aid to capital flight in Nigeria. Thus, foreign aid has the potentials to influence capital flight in both short-run and long-run through the corruption route.

**Recommendation**

Based on the study findings, the following recommendations are made:
i. The Economic and Financial Crimes Commission (EFCC) and Independent Crimes and other related offences Commission (ICPC) should beam their searchlights on foreign aid funds to track corrupt individuals who enrich themselves with the funds that usually transmit to capital flight from Nigeria. While monitoring this, these agencies should investigate how aid funds are utilized as evidences that could have possible links to capital flight.
ii. Foreign aid should be tied to specific projects by the Nigerian government. Such that each strand of the aid will be utilized for these projects with strict supervision of the Economic and Financial Crimes Commission (EFCC) and Independent Crimes and other related offences Commission. A specific team should also be put in place to specifically handle the projects executed with foreign aid funds to ensure they are used judiciously and not stacked foreign countries.

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