

## THE RELATIONSHIP BETWEEN CAPITAL FLIGHT AND POVERTY: THE CASE OF NIGERIA

**Kingsley Onyekachi ONYELE, Eberechi Bernadine NWOKOCHA**

Michael Okpara University of Agriculture, College of Management Sciences (COLMAS),  
Department of Banking and Finance, Umudike, Umuahia, Abia State, Nigeria, Mobile: +234-  
7033113792, +234-8067969426, Emails: kingsleyonyele@gmail.com, eby4real24@yahoo.com

*Corresponding author:* kingsleyonyele@gmail.com

### **Abstract**

*The study investigated the relationship between capital flight and poverty in Nigeria. The time series data spanning from 1986 to 2014 was analyzed using Johansen co-integration test and error correction model. The Johansen co-integration results revealed that a long run equilibrium relationship exist between capital flight and poverty (proxied by discomfort index) in Nigeria. Similarly, the error correction term showed that the present value of discomfort index (a proxy for poverty) adjusted rapidly to changes in capital flight, real exchange rate, real gross domestic product growth rate and adult literacy rate by approximately 66.82 percent in the long run. On the other hand, capital flight had a positive relationship with discomfort index (a proxy for poverty). Similarly, real gross domestic product (GDP) growth rate and adult literacy rate related positively with discomfort index. Among other things, it was recommended inter alia that government should lift the stringent penalties due to money launderers in order to encourage repatriation of their investments, coupled with strict policies aimed at preventing and checking further siphoning of national wealth.*

**Key words:** capital flight, discomfort index, poverty

### **INTRODUCTION**

Over the years, Nigeria have been known and described as the giant of Africa given her wealth of natural resources and large economy which is predominantly hinged on large foreign exchange revenue emanating from the export of crude oil. With such wealth of resources, one would expect an average Nigerian to be swimming in a pool of economic comfort. Paradoxically, however, the reverse is the case. Poverty have been a problem for a large proportion of the population in the past decades, with surges over 60 percent (Daniel, 2011, and National Bureau of Statistics, 2014) [9]. Consequently, a natural question that arises is; why is Nigeria experiencing high rate of poverty and economic discomfort amidst her wealth of resources? To answer this question, researchers have identified several factors that drive poverty and economic discomfort such as, high unemployment rate, inflation, political instability, corruption, low level of savings, unfavourable investment climate, high level of illiteracy and low productivity

(Daniel, 2011; and Onyedikachi and Chinweoke, 2013) [9, 28]. However, an important factor that have been largely neglected in the literature is the leakage of financial resources by way of capital flight. Globally, capital flight represents a problem not only for economists, policy decision makers, government, financial experts, but also, for the welfare of common people in developing countries of the world. Going through the literature, there is no universally accepted definition of capital flight. As such, the definitions in the literature are as varied as the authors both in conceptual terms and their coverage of sectors, assets and data availability. While some authors chose to refer all outflows of capital as capital flight, others opined that it was only a fraction of all outflows (Boyrie, 2010, Waleru, 2013, Ndiaye, 2014 and Ndikumana, *et al.*, 2014) [6, 18, 20, 37]. Nevertheless, the phenomenon known as “capital flight” specifically refers to the exodus of financial resources from investments in one country to another so as to avoid country-specific risks such as, political upheaval, high rate of inflation, fear of

confiscation and exchange rate volatility (Hermes & Lensik, 2001, Saheed & Ayodeji, 2012; Onoja, 2015, Uremadu *et al.*, 2016) [12, 31, 26, 36].

Literature abound that capital flight can be legal or illegal (Okoli, 2006) [24]. The legal perspective of capital flight is normally fleeing to safety and is expected to return to its country of origin when investment climate becomes attractive and rewarding. As such, the legal component is generally after-tax money, properly documented and remaining on the books of the entity from which it is transferred. There are ample evidences that such flows are often repatriated (Baker, 2000) [4]. Conversely, the illegal component is fleeing to secrecy to be accumulated secretly. As such, private bankers can rarely attest return to the country of origin (Baker, 2000) [4]. The illegal flight is improperly documented, following falsified transactions and it disappears from any record in the country of origin. The illegal perspective of the subject connotes money from activities such as money laundering, tax evasion, racketeering, child trafficking, drug trafficking, and the rest of them. Nevertheless, capital flight, in whatever form it appears would negatively affect capital formation in a capital scarce economy be it legal or illegal (Brada *et al.*, 2008; Adaramola & Obalade, 2013) [7,1].

According to Onyedikachi & Chinweoke (2013) [28], impaired access to capital resources explains poverty as the incapacity of gaining access to agricultural land, physical capital and financial assets; exposes the populace to impaired income level, unemployment and underemployment, undernourishment, and the rest of them. Generally, impaired access to resources shifts the focus on poverty and curtails the capability of an individual to convert available productive resources to a higher quality of life (Sen, 1997) [32]. Similarly, poverty can also be the outcome of inefficient use of common resources and wastages. This may result from capital flight due to weak policy and investment environment which results to inadequate infrastructure, weak access to technology, credit crunch, low

domestic product and the end result being increased economic discomfort. As such, massive capital flight from a developing economy will further accelerate economic discomfort which manifests itself in upsurge of poverty among residents of the country as scarce domestic resources are allowed to freely flow abroad through legal and illegal routes.

Surprisingly, Nigeria with endowment of abundant human and natural resources, the sixth largest oil producer with more than 3.5 million barrels of crude oil output per day is enlisted among the most corrupt countries of the world, whose citizens suffer from high rate of poverty (African Development Bank and Global Financial Integrity, 2010 and Waleru, 2013) [2, 37]. Similarly, Kale (2012) [16] asserted that poverty in Nigeria is a paradox – despite the fact that Nigeria's economy have continued to grow, the proportion of Nigerians living in poverty have accelerated every year. With the rate of almost \$10 billion annual loss to capital flight Nigeria will remain in the snares of acute poverty, unless such capital flights are repatriated (Adaramola & Obalade, 2013) [1]. It was also reported that Nigeria is among many African economies that have experienced low savings and investments as a result of capital flight (Ndiaye, 2014; Raheem & Adeniji, 2015) [20, 30]. Such low level of investments due to high rate of capital flight in Nigeria also have multiplier effect on other aspect of the economy, including the rate of unemployment, poor standard of education, fiscal deficit, low infrastructures, as well as pronounced regressive effect on resource allocation (Uguru, 2016) [33].

Following the austerity theory, the poor undergo much distress due to capital flight. This is because they are exposed to excruciating austerity measures (such as, spending cuts, tax increases, or a mixture of both) by government with the aim of reducing budget deficit (Pastor, 1990) [29]. As such, poverty in developing countries reduces them to hewers of wood and drawers of water, while perpetrating international inequality and dependency and widening the gap between the rich countries and poor countries.

Therefore, a vicious circle of capital flight, fiscal deficit, poor economic growth, and poverty is created. Furthermore, the tax that the poor may pay is small, which again constrains the ability of government to muster enough resources to promote growth and poverty alleviation schemes. Consequently, with the upsurge of this economic epidemic known as capital flight, the government will resort to incurring more external debt to fill the fiscal gap which will further propel more flight of capital due to debt servicing (Beja, 2006) [5].

Consequently, bearing in mind that the effect of capital flight can be threatening to economic growth and development, this study proceeded to explore the factors identified in the literature to account for capital flight, and how such factors have influenced poverty (proxied by discomfort index) in Nigeria. The sole objective of this paper, is to specifically test the influence of capital flight on poverty in Nigeria as detailed by the austerity theory. The findings there from offered explanations to the dynamics of capital flight in developing economies, with emphasis on Nigeria. At the end, suggestions aimed at abating the problem of capital flight in Nigeria was made to policy makers.

### **Empirical literature**

Uguru (2016) [33] studied the effect of capital flight on tax revenue in Nigeria using ordinary least squares (OLS) model was employed based on time series data quantifying capital flight under the hot money or balance of payment approach. It was found that a unit increase in capital flight caused a 2 percent decrease in tax revenue in Nigeria.

Uremadu *et al.*, (2016) [36], examined the effect of capital flight on financial savings in Nigeria. The results showed that capital flight exerted a negative and significant effect on financial savings. It was recommended *inter alia* that investments be directed and focused on infrastructural development and the real sectors of the economy in order to accelerate the level of capital formation, induce further growth of both private and foreign investments which would equally generate additional savings for further investments in the long run.

Obidike *et al.*, (2015) [23], investigated the impact of capital flight on the economic development in Nigeria. They adopted Autoregressive Distributed Lagged model (ARDL). The result of the model showed that capital flight had a negative and significant impact on economic development. It was recommended *inter alia* that government should take concerted steps to improve security of lives and properties in the country because security lapses constitute threat to business activities.

Onoja (2015) [26], examined the dynamic effect of capital flight on real exchange rate of the naira, using quarterly times series data covering the period of 1981-2009. Specifically, the study investigated if a long-run relationship existed between real exchange rate and capital flight in Nigeria. The study found that capital flight had no significant effect on real exchange rate, even at 10 percent level of significance.

Raheem and Adeniyi (2015) [30], examined both the total effect and the individual effects of the sources of capital inflow (foreign direct investment), official development assistance (ODA), remittances and debt, as well as capital outflow (capital flight) on economic growth for 33 countries in Sub-Saharan Africa (SSA) from 1970 to 2010. Using system generalized method of moments (Sys-GMM), the findings indicated that capital flight and debt constituted significant drags on growth. The key policy implication drawn from the results was for policy makers to design policies that will ensure investment friendly environment.

Olawale and Ifedayo (2015) [25], examined the impact of capital flight on economic growth in Nigeria using time series data from 1980 to 2012. The results showed that capital flight, foreign reserve, external debt, foreign direct investment and current account balance co-integrated with gross domestic product (GDP) in Nigeria. It was also discovered that capital flight had a negative impact on the economy. Based on the empirical findings, it was recommended that the government should create an enabling environment for profitable investments in order to reduce the incidence of capital flight in Nigeria.

Dim and Ezenekwe (2014) [10], examined capital flight and savings gap, underscoring the socio-economic determinants of capital flight in Nigeria. Among the variables included in the model, only lagged capital flight, fiscal balance and exchange rate were found to be significant in influencing capital flight in the country. The study therefore concluded *inter alia* that unless sound macroeconomic measures were taken to address these factors, capital flight would continue to paralyze economic activities in Nigeria.

Ndiaye (2014) [20], examined the effect of capital flight on economic growth in the Franc Zone (FZ). For the period 1970 to 2010, real capital flights from these countries were found to be positive and massive with a magnitude of roughly US\$86.8 billion (with the Adjusted World Bank method) or US\$80.1 billion (with the Adjusted Morgan Guaranty method). At the same time, the FZ countries experienced low and very volatile investment and growth rates. The econometric analysis showed that capital flight significantly reduced economic growth in the FZ countries.

Ndikumana (2013) [9], examined the implications of capital flight and tax havens for economic development in African economies. Specifically, the paper investigated the impact of capital flight on domestic investments and the opportunity costs of capital flight in terms of forgone growth. From the results, it was concluded that capital flight had a negative and statistically significant effect on domestic investments and that this effect holds even when other important determinants of investments were accounted for in the specification.

Onyedikachi & Chiweoke (2013) [28] studied on poverty and economic growth in Nigeria for the period, 1990 – 2011. The empirical results from the regression model, though contrary to economic expectations, showed a zero–correlation between poverty, discomfort index and economic growth in Nigeria. None of the parameter estimates of Human Development Index (HDI) and Discomfort Index was statically significant in explaining

economic growth in Nigeria. The result was attributed to poor attitude of the government towards human capital development.

Saheed & Ayodeji (2012) [31], employed the ordinary least square (OLS) method to analyze the secondary data obtained from Central Bank of Nigeria (CBN), and National Bureau of Statistics (NBS). The findings showed that capital flight had a positive and statistically significant impact on the exchange rate in Nigeria over the period studied.

Azziz *et al.*, (2014) [3], investigated the determinants of capital flight from Bangladesh using times series data from 1973 to 2013. Linear regression model was used and the method of ordinary least squares (OLS) function was applied to estimate the indicators of capital flight. It was identified that external debt, foreign direct investment, and foreign reserves to be the main causes of capital flight. Statistically, they proved that external debt was the major cause of capital flight from Bangladesh, and concluded that proper and efficient external debt management and utilization would be key strategy to combat the problem.

## MATERIALS AND METHODS

With the sole objective of investigating the relationship between capital flight and poverty in Nigeria, *ex post facto* research design was used. By definition, *ex-post facto* study is a category of research design in which the investigation starts after the fact had occurred without interference from the researcher. The data set comprises of annual time series spanning from 1986 to 2014.

The method of inferential statistics was adopted for the analysis of data, and it involved the statement and testing of hypothesis. The model specified for this study was adopted from the empirical literature reviewed, specifically, Onyedikachi & Chinweoke (2013), and Raheem & Adeniji, (2015) with some modifications [28, 30]. The model was specified in multivariate form as follow:

$$DCI = \beta_0 + \beta_1KF + \beta_2RER + \beta_3RGDP + \beta_4ADLT + e \dots \dots \dots Eqn (1)$$

The *a priori* expectations of the model are *ceteris paribus*:

$$\beta_1 > 0; \beta_2 > 0; \beta_3 > < 0; \beta_4 < 0;$$

where,

$\beta_0$  = Constant

$\beta_1 - \beta_4$  = Population parameters

DCI = Discomfort index (a proxy for poverty)

KF = Capital flight

RER = Real exchange rate

RGDP = Real gross domestic product growth rate

ADLT = Adult literacy rate

e = Estimated error term

### Description of Research Variables

The variables (both dependent and independent) relevant for this study are briefly explained below.

#### Dependent Variable

**(i)Discomfort Index (DCI):** According to Oswald (2001) [27], economic discomfort (or misery index) is an economic indicator used to determine how the average citizen is doing economically. The assumption here is that both unemployment and inflation creates both economic and social costs for a country. As such, some studies have used this index to measure poverty (i.e. Onyedikachi & Chiweoke, 2013) [28]. As proposed by Arthur Okun, economic discomfort is computed thus:

$$DCI = UNMPR + INFR \dots \dots \dots Eqn (2)$$

where,

DCI = Discomfort index

UNMPR = Unemployment rate

INFR = Inflation rate

#### Independent Variables

**(a)Capital Flight (KF):** Capital flight denote the massive outflow of domestic resources from less developed countries to the developed countries. Theoretically, this phenomenon causes a negative effect on savings, investments and economic growth (Uremadu, *et al.*, 2016) [36]. Hence, with the persistent outflow of resources, the domestic economic performance will deteriorate significantly, with poverty rate on the increase. Capital flight was computed using the residual (World Bank, 1985 and Guaranty

Trust Company, 1986) [17].

$$CFN = \Delta EXD + NFDI - (\Delta RSV + CAD) \dots \dots \dots Eqn (3)$$

Note: Capital flight was expressed as a ratio of real gross domestic product for the analysis.

**(b)Real Exchange Rate (RER):** Real exchange rate reflects the summary measure of the price of a country's product relative to those of other countries. Real exchange rate as an indicator of capital flight represents the notion that currency depreciation reduces purchasing power. Hence, capital flight arises as investors seeks to channel their investments cum savings abroad for higher returns due to depreciation of domestic currency (Saheed and Ayodeji, 2012; Onoja, 2015) [31, 26]. The real exchange rate between foreign countries *i* and the home country at time *t* is computed as follows:

$$RER_{i,t} = e_{i,t} \times \frac{P_t}{P_{i,t}} \dots \dots \dots Eqn (4)$$

where,

*p* is the price level of the home country, *p<sup>\*</sup><sub>i</sub>* is the price level in foreign country *i*, and *e<sub>i</sub>* is the nominal exchange rate between the currencies of foreign country *i* and the home country, expressed as the number of foreign currency units per home currency unit so that *e<sub>i</sub>* rises with an appreciation of the home-country currency.

**(c)Real Gross Domestic Product:** This is a measure of a nation's economic growth from one period to another. By definition, it is the monetary value of aggregate goods and services produced in Nigeria. Higher monetary values denote that domestic production is increasing, while lower values denote a decrease in domestic output. Hence, a negative growth rate will accelerate poverty rate and economic discomfort due to lack of goods and services for consumption and further generation of income in the economy (Ndiaye, 2014) [20].

**(d)Adult Literacy Rate:** This variable was computed as the ratio of educated adults to total population. High rate of adult illiteracy

can cause economic discomfort (i.e. unemployment, low income, corruption and other social vices) by reducing the level of skilled labour and the labour force as a whole (Onyedikachi & Chiweoke, 2013) [28]. As such, high rate of unemployment becomes prevalent, and as poverty and economic discomfort persistently increase. As a result, the educated ones who couldn't secure gainful employments domestically resort to travelling abroad for better employment opportunities; leading to a phenomenon known as brain drain or human capital flight (Collier *et al.*, 2003) [8].

## RESULTS AND DISCUSSIONS

The results obtained from the tests and data analysis were presented in Tables 1, 2, 3, 4, 5,

Table 1. Summary of Descriptive Statistics

	DCI	ADLT	RGDP	KF	RER
Mean	31.525	34.508	5.2050	158.14	109.85
Maximum	74.610	79.000	17.592	647.21	272.37
Minimum	10.540	10.300	-0.8214	0.0200	49.730
Std. Dev.	17.439	17.075	3.9441	195.14	60.455

Source: Authors Computations (2016) using Eview 8.0

The mean values in Table 1 shows that on average capital flight (KF) to real gross domestic product (RGDP) ratio was 158.14 percent, followed by real exchange rate (RER) 109.85 percent, adult literacy (ADLT) 34.508 percent, discomfort index (DCI) 31.525 percent and real gross domestic product (RGDP) growth rate (5.2050 percent).

Going through the mean of these variables, it can be observed that capital flight, discomfort index, adult literacy and real exchange are increasing at an alarming rate, while the low average of real gross domestic product growth rate shows that the Nigerian economic growth is slow.

The results also shows that discomfort index reached its maximum rate of 74.610 percent in 1995 and its minimum level was 10.540 in year 2000. Adult literacy rate was high in 1995 at 79 percent and decreased to 10.30 percent in 2007. Real GDP growth rate shows that the Nigerian economic performance have been poor, increasing from -0.8214 in 1991 to 17.592 percent in 2002 compared to its

and 6. These results includes the descriptive statistics, unit root test, co-integration test, error correction model and other diagnostic tests.

### Descriptive Statistics

Prior to the econometric analysis, a brief description of the data set was given. The descriptive statistics was used to describe the basic features (i.e. mean, standard deviation, maximum and minimum numbers) of the data set collated from Central Bank of Nigeria statistical bulletin, National Bureau of Statistics, Saheed and Ayodeji (2012) [31], Onyedikachi and Chinweoke (2014) [28], International Financial Statistics and Global Financial Integrity (2008, 2013) [2]. The output from the descriptive statistics was presented in Table 1 below.

average of 5.2050 percent.

On the other hand, the maximum value of capital flight to real GDP ratio shows that capital flight was increasing faster than domestic production. Capital flight to real GDP ratio recorded a minimum of 0.02 percent in 1997, by 2007 (10 years after) it reached its maximum value of 647.21 percent. Similarly, real exchange rate hit its highest rate in ₦272.37/\$1 in 1998, while the lowest rate of ₦49.73/\$1 was experienced in 1992 denoting that the Naira have been depreciating significantly.

The standard deviation of the variables shows that capital flight to real gross domestic product ratio was highly volatile with an index point of 195.14, followed by real exchange rate (60.455), discomfort index (17.439), adult literacy (17.075) and real gross domestic product growth rate (3.9441) percent.

### Augmented Dickey-Fuller Unit Root Test

This is the test of non-stationarity under time series variables in order to avoid spurious regression results.

Unit root tests are carried out on the individual variables in isolation; that is, it does not take into account any relationship that might be between the variables being

tested and any variable selected to be in the model.

The study employed the Augmented Dickey – Fuller (ADF) tests presented in Table 2.

Table 2. Augmented Dickey Fuller (ADF) Test Results

Variables	ADF @ Level	ADF @ 1 <sup>ST</sup> Difference	Decision
DCI	-3.122884	-3.922354**	I(1)
KF	-2.683383	-5.755046***	I(1)
RER	-3.566754	-6.022959***	I(1)
RGDP	-3.233070	-7.201810***	I(1)
ADLT	-1.758872	-4.458024***	I(1)

Source: Authors Computations (2016) using E-views 8.0

Table 2 shows the unit root test results for the variables used in the analysis. The test was conducted using the Augmented Dickey Fuller (ADF) model. The results indicates that all the variables in the model were integrated of order one. Consequently, after taking the first differences of all the variables they became stationary. These results implies that the regression results that would be obtained from the model earlier specified would return a spurious result if there is no long-run relationship among the variables in the model. Hence, the need to ascertain the long run relationship using co-integration test.

### Co-integration Test

Co integration is the statistical implication of the existence of long run relationship between the variables which are individually non-stationary at their level form, but stationary after difference (Gujarati, 2004) [11]. The Johansen test of co-integration uses the likelihood ratio to test for co-integration. Up to (r-1) co-integrating relationships may exist between a set of r variables. The hypothesis of co-integration is accepted if the number of co-integrating relationships is greater than or equal to one. If the likelihood ratio is greater than the critical value, the hypotheses of co-integration is accepted, if not it is rejected in favour of the null hypothesis of no co-integration. The co-integration results are presented in Table 3 below.

The results of the Johansen co-integration tests are as presented in Table 3. The results shows that the null hypothesis of no co-integration, that is 0 can be rejected using either max-eigen or trace tests statistics.

Table 3. Johansen Co-integration Test Results

Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value	Max-Eigen Statistic	0.05 Critical Value
None *	135.62	69.818	62.363	33.876
At most 1*	73.259	47.856	32.196	27.584
At most 2*	41.062	29.797	29.197	21.131
At most 3	11.865	15.494	8.5706	14.264
At most 4	3.2946	3.8414	3.2946	3.8414

Source: Computed by Authors (2016) Using E-view 8.0

The max-eigen and trace tests are both greater than their respective critical values. Consequently, these test results indicate that, discomfort index is co-integrated with the measures of capital flight, real exchange rate, adult literacy and real gross domestic product growth rate. After ascertaining that the variables are co-integrated, the error correction model (ECM) was used to capture the short run and long-run behaviour of the variables used in the study.

### Error Correction Model

Given that a co-integrating relationship is present among the selected variables at level, an error correction model (ECM) model can be estimated, that is, a model that combines both the short-run properties of the economic relationships as well as the long-run information. The error correction model results are presented in Table 4.

From Table 4, capital flight (KF) and real exchange rate (RER) are in line with *a priori* expectation, while adult literacy rate (ADLT) which was expected to be negative surprisingly assumed a positive coefficient. However, real gross domestic product was expected to have either positive or negative coefficient depending the rate of growth.

The error correction term – ECM (-1) which

has the expected negative sign, is significant at 1 percent with absolute value of 0.668218. The implication of this is that there is convergence in the long run, as was earlier revealed by the co-integration test. The coefficient indicates that the speed of adjustment from the short-run to the long-run is high, such that about 66.82 percent errors

made in the previous year were corrected in the current year. This implies that the present value of discomfort index adjusted rapidly to changes in capital flight, real exchange rate, real GDP growth rate and adult literacy rate by approximately 66.82 percent in the long run.

Table 4. Error Correction Model Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(KF)	0.0179	0.0079	2.2707	0.0357
D(RER)	0.0279	0.0281	0.9949	0.3330
D(ADLT)	1.0456	0.1015	10.295	0.0000
D(RGDP)	0.8524	0.3118	2.7338	0.0136
C	1.6479	1.1422	1.4427	0.1663
ECM(-1)	-0.6682	0.1429	-4.6741	0.0002
R-squared	0.8714			
Adjusted R-squared	0.8357			
F-statistic	24.400			
Prob(F-statistic)	0.0000			

Source: Computed by Authors (2016) Using E-view 8.0

With respect to the general significance of the explanatory variables, the adjusted R-squared value implies that about 83.57 percent change in one period lag of discomfort index are explained by the variations in explanatory variables, denoting that the regression has good fit and is reliable. The F-statistic- a measure of the overall significance of the regression, shows that the explanatory variables are significant at the 1 percent level. The constant (C) suggests that if all the explanatory variables (KF, ADLT, RER and RGDP) are held constant, poverty (proxied by discomfort index) in Nigeria will increase by approximately 164.79 percent. However, judging from the P-value (0.1668), the constant is not significant at 5 percent and even 10 percent level.

### Discussion of Findings and Hypothesis Testing

The only hypothesis to be tested in this study is as stated in null form below.

***H<sub>01</sub>: Capital flight have no significant relationship with discomfort index in Nigeria.***

The results presented in Table 4 suggest that capital flight fuelled poverty (proxied by discomfort index) in Nigeria. The coefficient of capital flight shows that 1 percent increase in one period lag of capital flight caused

discomfort index (a proxy for poverty) to increase by 1.796 percent. This is in line with the austerity thesis of capital flight which holds that the poor suffer due to austerity measures by government to pay for debt obligations emanating from fiscal deficit. Again, it is also in line with *a priori* expectation that capital flight will increase economic discomfort (a proxy for poverty) by draining domestic resources. Again, other empirical literature that lend support to this finding are (Uguru, 2016, Azziz *et al.*, 2014, Ndikumana, 2013, and Ndiaye, 2009) [33, 3, 19, 21]. These resources, if available domestically will be used to salvage the economic welfare of Nigerian citizens. Judging from the P-value (0.0357) of capital flight which is less than 5 percent, the null hypothesis was rejected in favour of the alternative hypothesis that “capital flight have a significant relationship with poverty (proxied by discomfort index)”. Hence, it was concluded that the austerity theory of capital flight have a force to bear in Nigeria given the results obtained for the study.

With regards to adult literacy, discomfort index (a proxy for poverty) increased by approximately 104.56 percent due to 1 percent increase in one period lag of adult literacy rate. This relationship is significant at 1



percent level. As such, it lends support to the findings of Onyedikachi & Chinweoke (2013) [28] who concluded that adult literacy had an adverse effect on economic growth in Nigeria. Such negative effect from adult literacy rate to economic growth could be a plausible reason for the result obtained in this study that adult literacy rate fuelled economic discomfort index (a proxy for poverty). Also, coupled with the limited employment opportunities and economic instability prevalent in Nigeria, the educated ones seek for employment opportunities in developed countries with better offers than Nigeria, hence, degenerating to brain drain (Collier *et al.*, 2003) [8]. The implication of this finding is that changes in adult literacy rate low in Nigeria.

Also, from Table 4, one period lag of real gross domestic product growth rate caused discomfort index (a proxy for poverty) to increase by approximately 85.24 percent due to changes in domestic output of goods and services. This implies that due to low domestic production, economic discomfort (that is, poverty) increases as a result of lack of goods and services for domestic consumption. Literature abound that low GDP growth rate in Nigeria is a function of high rate of capital flight (Umoru, 2013, Ajayi 2014 and Obidike *et al.*, 2015) [35, 23]. As a result, exports reduce drastically and demand for imports increases. As such, domestic resources will be used to pay for such imported goods which have accounted for the depreciation of the Naira and high inflation in Nigeria. Also, over-reliance on crude oil for export earnings have not been encouraging due to the volatility of oil prices in the international market, especially in recent times.

Finally, the coefficient of real exchange rate suggests that a positive relationship exist between real exchange rate and economic discomfort index. This implies that, a 1 percent increase in one period lag of real exchange rate will cause economic discomfort to increase by approximately 2.79 percent. Literature such as Saheed and Ayodeji (2012) [31], Uguru *et al.*, (2014) [34] and Onoja (2015) [26] concluded that a positive relationship exist between capital flight and

exchange rate, which lends support to the findings of this study. However, judging from the P-value (0.3330) real exchange is not significantly different from zero. This implies that in the short run, the real exchange rate does not influence economic discomfort (a proxy for poverty) in Nigeria. Rather other factors such as capital flight, real gross domestic product and adult literacy rate as earlier explained drive poverty (as proxied by discomfort index) in Nigeria.

#### **Stability tests**

According to Jason and Waters (2002) [14], most statistical tests are based on certain assumptions about the variables used in the analysis. When these assumptions are not met, the results may not be trustworthy resulting to a type 1 or type 2 error. Consequently, the tests to be carried out under the stability tests include serial correlation, normality, and multicollinearity tests. These tests results are summarized in Tables 5 and 6, respectively.

#### **Normality and Serial Correlation Tests**

Regression assumes that variables have normal distributions. Non-normally distributed variables can distort relationships and significance tests (Jason and Waters, 2002) [14]. Consequently, to test for normality of the data set, the Jarque-Bera statistic was employed. If the data comes from a normal distribution the Jarque-Bera test has a chi-squared distribution with two degrees of freedom, so the statistic can be used to test the hypothesis that the data set are normally distributed (Jarque and Bera, 1987) [13].

On the other hand, autocorrelation refers to the existence of a relationship between error terms across observations of a time series (Noula, 2013) [22]. In this study, autocorrelation was tested using the Breusch-Godfrey serial correlation LM test. The decision rule is to accept  $H_0$  if the probabilities of the F-statistic and the observed  $R^2$  are greater than 0.05, which depict the absence of auto correlation and vice versa.

The Jarque-Bera test in Table 5 indicates the acceptance of the null hypothesis that the errors are normally distributed given its P-value (0.978249).

Table 5. Tests Results for Normality and Serial Correlation

Jarque-Bera Normality Test	Prob.	Breusch Godfrey Serial Correlation LM Test	Prob.
Jarque-Bera 0.043982	0.978249	F-statistic 2.472440	0.1160
		Obs* R-Squared 5.6665165	0.0588

Source: Authors Eview Output (2016)

Similarly, judging from the test results presented above, the probabilities of both the F-statistic (0.1160) and the observed R-squared (0.0588) are greater than 0.05. Therefore, the null hypothesis (Ho) was not rejected, implying that autocorrelation is absent.

#### Multicollinearity Test

Multicollinearity is a high degree of correlation (linear dependency) among two or more independent variables. It commonly occurs when two or more independent variables are incorporated in a regression model. It is because some of them may

measure the same concepts or phenomena. Multicollinearity inflates the variances of the parameter estimates and hence this may lead to lack of statistical significance of individual predictor variables even though the overall model may be significant (Joshi, 2012) [15]. A common method of testing for multicollinearity is the use of variance inflation factor (VIF) which quantifies the severity of multicollinearity in an ordinary least-squares regression analysis. The VIF is calculated thus.

$$VIF = 1 / (1 - R^2) \dots\dots\dots Eqn (4)$$

where,

VIF = Variance inflation factor

R<sup>2</sup> = Adjusted coefficient of determination

**Rule of Thumb:** If the VIF exceeds 10, it implies that the associated regression coefficients are poorly estimated because of multicollinearity (Joshi, 2012) [15].

The VIF results are presented in Table 6 below.

Table 6. Summary of Variance Inflation Factor (VIF) Results

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
D(ADLT)	0.010314	1.104106	1.101781
D(RGDP)	0.097229	1.284952	1.273437
D(KF)	6.26E-05	1.370411	1.367177
D(RER)	0.000790	1.334222	1.330674
C	1.304718	1.018161	NA
U(-1)	0.020438	1.344757	1.344708

Source: Authors Eview Output (2016)

Since none of the VIFs on Table 6, are not greater than 10, it was concluded that multicollinearity is absent. As such the explanatory variables used for the analysis are not correlated with each other. Hence, the null hypothesis that there is no multicollinearity among the explanatory variables was accepted.

## CONCLUSIONS

This paper examined the relationship between poverty (proxied by discomfort index) and capital flight in Nigeria using time series data spanning from 1986-2014. The study revealed that persistent outflow of domestic resources

due to capital flight have left a large proportion of Nigerian citizens to drown in the pool of poverty. Capital flow which occur as a result of exchange between countries have degenerated to an economic plague known as capital flight. Hence, if these large amount of money kept abroad by Nigerians are not repatriated, the menace of poverty will continue to deny Nigerian citizens of their national comfort. Due to the multiplier effect of capital flight on economic growth, real gross domestic product which is often seen as a remedy to the rising incidence of poverty in Nigeria have also failed to fulfill this expectation. Consequently, due to poor capital formation occasioned by capital

flight, investments in infrastructures, especially in the educational sector and other key sectors of the Nigerian economy have declined which probably depleted the literacy rate, domestic production, and savings in Nigeria. In conclusion, it is glaring that the "marriage" that have lasted between capital flight and the Nigerian economy is begging for a "divorce".

Based on the findings from this study, the following suggestions were recommended:

-Policy makers should make efforts towards creating an enabling business and economic environment that will attract foreign investors. As such, proper diversification of the Nigerian economy is a good step towards achieving this fate.

-Since it is well known that Nigerian politicians hoard the resources they launder from the nation's treasury. The government should lift some of the penalties due to these looters and allow them to invest in Nigeria coupled with stringent policies aimed at preventing further laundering of national wealth.

-Capital inflows and repatriation can be more effective if it is directed at improving and expanding managerial and labour skills in the domestic economy. In other words, the task of helping a "poor beggar" can be made more fruitful if it is directed at teaching him a trade rather than giving him food to eat. As such, the search for employment opportunities abroad (brain drain) will be reduced.

-To improve the growth rate in Nigeria, the government must acknowledge that the basic element in any prosperous development strategy should be to encourage residents first before considering foreign investors, due to the fact that they make up the bulk of investment activities in the economy. Thus, the most effective strategy for attracting foreign capital is to make the Nigerian economy very attractive and comfortable to Nigerian investors first.

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