

# Impact of Economic Crimes on Nigeria's Economic Prosperity under A Democratic Framework

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Received: June 3, 2015

Accepted: July 19, 2015

Online Published: August 22, 2015

doi:10.5539/ijbm.v10n9p163

URL: <http://dx.doi.org/10.5539/ijbm.v10n9p163>

## Abstract

Although, economic crimes are not new phenomena in Nigeria, however, their size, sophistication and magnitude have changed in recent times. Theoretical literature on economic crimes and economic growth has generated a rich debate over the last few years producing scholars who theorized that economic crimes could be growth-enhancing and others who see it as growth-reducing. Where is Nigeria in this great debate? The failure to determine the nature of the relationship between economic crimes and economic growth in previous empirical works affected the choice of methodology employed by previous empirical works on Nigeria. This study is an attempt to offer a better methodology and proxy in the estimation of this relationship. Therefore, this study aims at providing robust econometric analysis, which deepens the understanding of the relationship between economic crimes and economic growth in Nigeria both in the short run and long run within the uninterrupted democratic dispensation period of 1999 to 2012 using OLS technique incarnated in a state-space time-varying methodology. Findings show a strong evidence of non-linear significant relationship between economic crimes and economic growth in Nigeria in the long-run with infinitesimal short run impact. The study also found a bi-directional causal relationship between economic crimes and economic growth in Nigeria and recommends, amongst others, a matrix of policies that address effective reduction of economic crimes, which includes heavy investment in infrastructure especially energy which nourishes industrial build-up that in turn creates employment as well as reduce the level of poverty.

**Keywords:** economic crimes, economic prosperity, illicit financial outflows

## 1. Introduction

The global economy is faced with myriads of economic and social problems that increase in magnitude and dimension daily. Suicide bombings and killings, terrorism and insurgencies, drug trafficking, smuggling, money laundering, systemic corruption etc are some of those crimes that threaten the corporate existence of many countries of the world today. However, crimes that are economic in nature are known as economic crimes.

Section 46 of the Economic and Financial Crimes Commission's Act, 2004, defines economic crimes as "non-violent criminal and illicit activities committed with the objective of earning wealth illegally either individually or in a group or organised manner thereby violating existing legislation governing economic activities of government and its administration and includes any form of fraud, money laundering, smuggling, currency counterfeiting, tax evasion, corruption, embezzlement etc. These constitute the typologies of economic crimes.

The history of economic crimes in Nigeria can be traced back to the colonial era. The consular court system disrupted the traditional administration, which the white colonialists met. In its place was appointed the highly flawed indirect rule under which appointment of personnel was arbitrarily made. Oftentimes, appointees were unknown people, different from the traditional heads and chiefs. Many of the appointed people were of questionable character who often became intoxicated by power, leading them to abuse and misuse of office, including showing favours to criminals. Therefore, the colonial heritage, legal traditions, religion, and geographical factors seem associated with economic crimes and other measures of government dysfunction.

The authors note that in the Post-Colonial Era of the Civilian and Military Regimes, the First and Second Republics were characterised by electoral malpractices, misappropriation of public funds and corruption. The

military and civilian regimes accused each other of corruption and this was the major reason for rejection and takeover of government. Today, it is said that the worst civilian regime is better than the best military regime. The overall implication of this is that the once cherished culture of probity and honesty in public affairs soon yielded place to a culture of graft and the standard of public morality continued to deteriorate, giving way for serious economic crimes.

Corresponding to the Colonial and Post Colonial Era was an industrial policy known as the Import Substitution Industrialization (ISI) that advocated the replacement of foreign imports with domestic production as an attempt to reduce foreign dependency through industrialized products, thus producing development and self-sufficiency through the creation of an internal market. ISI was gradually abandoned because this strategy appears not to have created the necessary foundation for an industrial revolution as it failed to develop capacities for export manufactures and even failed to produce enough to serve expanding domestic demand (Ogujiuba, Nwogwugwu, & Dike, 2011).

By 1980s, the economy took a different turn, partly due to declining oil revenues, structural indebtedness etc, which precipitated the adoption of the Structural Adjustment Programme (SAP) from July 1986 on the insistence of IMF and the World Bank, of which trade liberalization aimed at the Global South was a major element. It was expected that a liberalized trade regime would stimulate industrial output expansion and enhance a better performance of the economy. However, contrary to expectations that SAP policies would shift production and trade towards outward orientation, the industrial sector seems not to have made any significant contribution to export earnings (Tamuno, & Edoumiekumo, 2012). The SAPs conceived and implemented for West African countries by IMF and the World Bank created loss of jobs and diminishing employment opportunities, reversal of industrial development, exclusion of majority of the population from vital social and welfare services (especially education and health care) and a fragile state. These developments produced favourable environment for entrenchment of economic crimes witnessed today. Globalisation and indeed information and communication technology that integrated Nigerian economy into the global economy have thus, provided economic offenders with a tool for both committing economic crimes and laundering the proceeds that their acts generate (Swank, 2002).

Fruitful attempts have been made to measure economic crimes. There is Corruption Perception Index developed by Transparency International in 1995. This index has a band of 0 to 100. An index closer to zero signifies a very corrupt country, while an index closer to 100 signifies a country almost free from corruption. Table 1 below represents Nigeria's level of corruption relative to the rest of the world.

Table 1. Nigeria's corruption perception index (CPI) and relative corruption ranking (RCR) 1995 to 2014

YEAR	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
CPI	0	0.69	1.76	1.9	1.6	1.2	1.0	1.6	1.4	1.6
RCR	0	54	52	81	98	90	90	101	132	144
YEAR	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CPI	1.9	2.2	2.2	2.7	2.5	2.4	2.4	2.7		
RCR	152	142	147	121	130	134	143	147	144	136

Source: Transparency International Report, 2014.

Table 1 above portrays Nigeria as a very corrupt country. Furthermore, statistics on Illicit Financial Outflows (IFFs) as a measure of economic crimes was developed by Global Financial Integrity using two known models such as World Bank Residual Model and IMF Trade Mis-invoicing Model. IFFs refer to unrecorded capital outflows that derive from criminal, corrupt (bribery and theft by government officials) and commercial activities (Baker, 2005).

Khan and Blenkenburg, 2012 posit that the components of IFFs include proceeds of theft, bribery and other forms of corruption by government officials; proceeds of criminal activities including drug trading, racketeering, counterfeiting, money laundering and terrorist financing; and proceeds of tax evasion and laundered commercial transactions.

Economic crimes have risen in size and magnitude in recent times. Parton, Rajarao and Skalak (2009) observe that economic crime has become a global phenomenon thriving even in a downturn. Cost of cybercrime globally is estimated to be US\$ 388 billion for 2011 (Ernesto, 2012), while World Bank estimates that Worldwide bribery totals at least \$1 trillion per year, just over 3% of world income in 2002 (Kunicova & Ackerman, 2003). In the

same vein, money laundered every year is estimated at about 2.0 to 5.0 percent of world Gross Domestic Product (GDP) (IMF, 2004; Parton et al., 2009), whereas GFI, 2012 estimates that IFFs from Africa across 1970 through 2012 is at some \$1.8 trillion while that from Nigeria is \$217,738.1 billion respectively. Recently, African Union Reports that N6.2 trillion is stolen from Nigeria yearly (Vanguard, 3rd January, 2015) just as UK Government decided to return £6.8 million of the confiscated loot of former Delta Governor, James Ibori to Nigeria after returning £1.2 million (Guardian, 23rd November, 2014). Furthermore, Diepreye Solomon Peters Alamieyeseigha pleaded guilty and was jailed for two years for money laundering of about N6 billion and bought about 172 houses across the globe (This Day, 2006). It would be recalled also that the findings of Justice Nwazota Panel which were accepted by the government were scandalous and shocking as it revealed that a whopping total of \$254,257.65 million; £1,792.2 million and N548, 380,248.00 billion were looted from the Nigerian Airways Limited through tax fraud, contract inflation, ticket scam, fake projects, misappropriation and outright stealing (Moses, 2006).

Comparing IFFs with some macroeconomic indicators such as National Debt and External Reserve in Figure 1 below, reveals some interesting features. Their behavior is almost similar but with a significant change from 1999 through 2013 corresponding to the period of the uninterrupted democratic dispensation. This sort of relationship elicits attention, more so, when Nigeria is ranked 1st in the list of African countries where IFFs are the most (GFI, 2012).

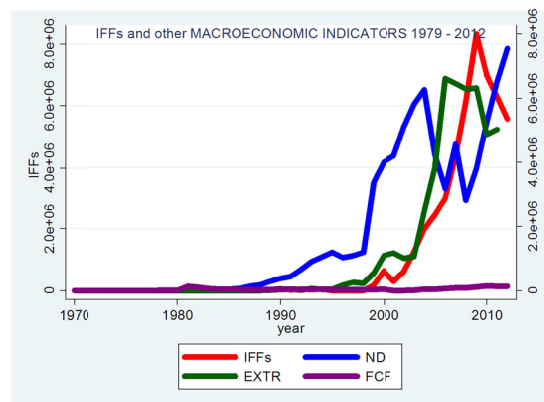


Figure 1. IFFs and some macroeconomic variables

Source: Authors estimation using data from CBN and Global Financial Integrity.

Figure 2 below indicates the slope of both IFFs and RGDP over 1970 through 2013. The variables almost exhibited similar behaviour all through the period but with large noticeable upward trend from 1999 through 2013. Whereas, RGDP surpassed IFFs from 1980 through 1998, IFFs surpassed RGDP from 1999 through 2013.

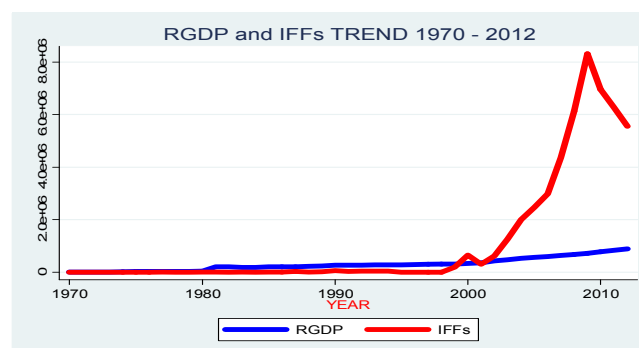


Figure 2. RGDP and IFFs trend 1970-2013

Source: Authors estimation using data from CBN and Global Financial Integrity.

It agitates the mind of the researchers that economic crimes strongly persisted despite governments efforts to curb them. The wide gap noticed between economic crimes and economic growth in Figure 2 above especially within the uninterrupted democratic dispensation period perhaps holds some implication for the Nigerian economy especially as it concerns her hard earned democracy, which is believed to drive most economies of the world today. Nwabude (2014) theorized that democracy and economic progress are compatible. Furthermore, this sort of relationship in Figure 2 above makes it imperative to take a critical study of the nature of the relationship between economic crimes and the Nigerian economy especially within the uninterrupted democratic dispensation as this would shed light on why economic crimes have persisted despite government's efforts to curb them.

Theoretical literature on economic crimes and economic growth has generated a rich debate over the last few years. Scholars studying economic crimes have theorized both how economic crimes can reduce economic growth and also how it can increase economic growth. On the one hand, scholars such as Ekundayo, Obasaju, AdedoyinIsola and Iseolorunkanmi (2013), Rotimi and Obasaju (2013), Ezema and Ogujiuba (2012) and OECD (2012) have argued that economic crimes are detrimental to economic growth. They point out that economic crimes modify government goals and divert resources from public purposes to private ones, thereby resulting in deadweight loss to society. Furthermore, economic crimes may also discourage private investment by raising the cost of public administration or by generating social discontent and political unrest, which in turn, may slow economic growth. On the other hand, Colombatto (2003), Wedeman (1997) and Lui (1985) theorize that it is possible for economic crimes to be beneficial to economic growth by circumventing pervasive and inefficient regulations at low cost as well as speed up the bureaucratic process. Specifically, Wedeman (1997) observe that many corrupt countries have rapid growth rates. However, Ahmad, Ullah and Arfeen (2012) and Powell, Manish and Nair (2010) find economic crimes to be growth-enhancing at low levels of incidence and growth-reducing at high levels of incidence.

Empirical literature, for instance, the works of Mauro and Carmeci (2007), Nageri, Gunu and Falilat (2013) and Ekundayo et al. (2013) have consistently reported a negative linear relationship between economic growth and economic crimes except the works of Ahmad et al. (2012) and Aidt, Dutta and Sena (2008) who found non-linear relationship between economic growth and economics crimes in a panel of countries. It is, however, not certain if a non-linear relationship exists between economic crimes and economic growth in Nigeria as no empirical investigation on the relationship between economic growth and economic crimes have come to this conclusion.

The first step towards determining why economic crimes have persisted despite government's efforts to curb them lies in the determination of the nature of the relationship between economic crimes and growth of the Nigerian economy, which has left a wide gap in most empirical works reviewed. This failure to determine the nature of the relationship between economic growth and economic crimes has also affected the choice of methodology employed by previous empirical works on Nigeria. This study is an attempt to offer a better methodology in the estimation of this relationship.

Furthermore, a significant challenge faced by empirical works on Nigeria is the choice of proxy for economic crimes. Most of the empirical works reviewed used corruption perception index, which is subjective in nature with very short time points, as proxy for economic crimes and suggested that the direction of causality is from economic crimes to economic growth and not vice versa. Definitely, a variable that is largely objective in nature and has larger time points is preferable to the one that is subjective.

Therefore, this study aims at providing robust econometric analysis, which deepens the understanding of the relationship between economic crimes and economic growth in Nigeria both in the short run and long run within the uninterrupted democratic dispensation period of 1999 to 2013 using a state-space time-varying methodology. It is believed that this will shed brighter light on the impact of economic crimes on the Nigerian economy. The rest of the paper is structured as follows: section 1 is introduction while theoretical framework and empirical review are contained in section 2. Section 3 is the model specification and the analytical techniques while section 4 contains data presentation and analysis. Section 5 is conclusion.

## **2. Literature Review**

### *2.1 Theoretical Literature*

Ezema et al. (2012) posit that "corruption is endemic and has eaten deep into every facet of our national life. The productive and technological base is weak, outdated, narrow, inflexible and externally dependent. The infrastructure is poor, inadequate and lacks maintenance. The effectiveness of incentives has been generally low, giving rise to inadequate utilization of the factors of production. Furthermore, policy instability and summersaults are discouraging foreign investment despite the huge domestic market and the strategic location of

the nation. The obvious effects have produced a weak private sector largely oriented towards distributive activities”.

UNECA and UAC, 2012 observe that economic crimes affect indigenous entrepreneurship, more so with trade liberalization. Proceeds of economic crimes are used to bring in and ‘dump’ goods in the market, which are sold at prices below cost price in the exporting country. The reason for selling at a very low price is that economic criminals (money launderers) import so as to transfer their dirty money and not for profit motives. The situation depresses domestic production due to the uncompetitive pricing of the imported products. Because the return on investment on domestic production and other legitimate business activity will almost inevitably be lower than the high returns made by money launderers, domestic production is depressed by their activities. This situation affects small and medium scale enterprises which are the growth targets the government is addressing. Consequent to this development, foreign investment will decline, because investors will be scared of an economic environment where illicit monies are allowed to play a significant role in the allocation of resources.

Kar (2011) opines that money laundering impacts on the poorest in society potentially and most destructively too. It eviscerates foreign aid. It is argued that for every dollar, which is given to developing countries in aid, ten dollars flow back out in illegal funds. Half of the one trillion dollars of dirty money which flows across borders each year comes from developing countries.

The International Monetary Fund has registered inexplicable fluctuations in currency demand, prudential risks to bank soundness, contamination effects on legal transactions and heightened unpredictability of international capital flows and exchange rates due to money laundering (IMF, 2012). Osisioma (2009), states that in Nigeria, embezzlement of federal funds by certain state government actors has led, in many cases, to the naira’s devaluation and concomitant sparse supply of sterling and US dollars as launderers purchase foreign currency to export. A more unstable financial environment precipitated by money laundering means a financial environment less conducive to sustained growth. The East Asian Financial Crisis of 1997, although an extreme case, was an example of how quick and unpredicted outflows of capital crippled several economies.

## *2.2 Classical Growth Theory*

This theory sought to determine the sources and composition of growth and what can hinder growth. The proponents of this theory posit that the way income is distributed among classes in the society determines whether growth occurs or how growth proceeds. It also determines the saving behavior of classes in the society which is critical for growth. Therefore, growth flows from the distribution of income. High level of corruption distorts the allocation of public resources and leads to a more unequal distribution of income. Gupta, Davoodi, & Alonso-Terme (2002) in a study on corruption, inequality and poverty observed that high levels of economic crimes produce a more unequal distribution of income under some conditions, but the mechanism may be complex—operating through lower investments in education and lower per capita incomes. Rotimi et al. (2013) assert that there are strong indications that the changes in income distribution that have occurred in recent years in previously centrally planned economies have been partly the result of corrupt actions.

## *2.3 Circular Flow of Income Model*

A continuous flow of production, income and expenditure is known as circular flow of income. The circular flow of income involves two basic principles:

- 1). In any exchange process, the seller or producer receives the same amount what the buyer or consumer spends.
- 2). Goods and services flow in one direction and money payment to get these flows in return direction, causes a circular flow.

In terms of the circular flow of income model, the leakage that financial institutions provide in the economy is the option for households to save their money. This is a leakage because the saved money cannot be spent in the economy and thus is an idle asset as not all output will be purchased. The injection that the financial sector provides into the economy is investment (I) into the business/firms sector. The Economic theory posited by Keynes observed that all that is saved may not be invested, thus producing disequilibrium. Thus, banks sometimes are conduits for money laundering.

The Government Sector in the circular flow consists of the economic activities of local, state and federal governments. The leakage that the Government sector provides is through the collection of revenue through Taxes (T) that is provided by households and firms to the government. Economic crimes involving tax evasion and commercial mis--invoicing could shrink tax revenue. For this reason they are a leakage because it is a leakage out of the current income, thus reducing the expenditure on current goods and services. The injection provided by the government sector is government spending (G) that provides collective services and welfare

payments to the community. When tax revenue shrinks due to economic crimes, government expenditure is affected.

The next sector in the circular flow of income model is the overseas sector which transforms the model from a closed economy to an open economy. The main leakage from this sector are imports (M), which represent spending by residents into the rest of the world. The main injection provided by this sector is the exports of goods and services which generate income for the exporters from overseas residents. Over-invoicing of export acts as a leakage instead of injection. Figure 3 below sheds more light on the flow.

Figure 3. Four-Sector circular flow of income model

Source: Jhingan (2009).

The significance of the study of circular flow of income to this research can be seen in the measurement of national output/income. National income is an estimation of aggregation of any of economic activity of the circular flow. It is either the income of all the factors of production or the expenditure of various sectors of the economy. However, aggregate amount of each of the activity is identical to each other. Again, the circular flow of income signifies the interdependence of each activity upon one another. For the economy to be in equilibrium, all the behaviours of all the components (both observed and unobserved) of the national income are important. Gupta et al (2002) in a study on corruption, inequality and poverty observed that high levels of economic crimes produce a more unequal distribution of income under some conditions, but the mechanism may be complex-operating through lower investments in education and lower per capita incomes.

#### *2.4 Empirical Literature Review*

In this sub-heading, the researcher explored previous empirical studies conducted in this area of study with a view to discovering the gap in literature, which formed the basis of this research. To this end, a number of works were reviewed both foreign and local.

Ekundayo et al., (2013), in a study to analyse Corruption and Economic Growth in Nigeria using GDP as the dependent variable and corruption, previous degrees of corruption and corruption perception index for Nigeria as explanatory variables and adopting OLS concluded that corruption impairs economic growth. This study failed to identify any scope or even identify the sources of data and so the reliability of data and result drawn there from are put in doubt. Moreover, corruption perception index is just the perception of individuals with regard to corruption and this perception is largely subjective with minimal time points.

Ahmad et al. (2012) using panel data from 1984 to 2009 for 71 developed and developing countries, with corruption index, corruption squared, bureaucratic efficiency index, political stability index, institutional efficiency index, risk to investment index etc while employing generalized methods of moments estimation (GMM) find that decrease in corruption raises economic growth rate in an inverted U-shaped way.

Aidt et al. (2008), in an empirical study on Governance Regimes, Corruption and Growth: Theory and Evidence in a panel data analysis using voice and accountability index, corruption index and gdp as variables found a non-linear relationship between corruption and growth and therefore concluded that there is no relationship between corruption and growth in countries with low-quality political institutions.

Méon and Sekkat (2005) in an empirical study on whether corruption greases or sands the wheels of growth using voice and accountability index, bureaucratic efficiency index, political stability index, institutional efficiency index as variables and employing panel technique conclude that corruption ‘sands the wheel’ of economic growth.

Lambsdorff (2003), using survey method in generating his data and employing descriptive statistics in his analysis, finds that corruption is responsible to reduced capital productivity among a panel of countries. This result reinforces the time allocation model of crime and economic growth. In this model, crime and work are substitutes. The more time is allocated to crime, the less time work gets and this implies lower human and capital productivity. Use of descriptive statistics only hampers robust analysis.

Cadernas (2007) focuses on relationship between growth rate and organized crime in an unbalanced panel of 65 countries and found that criminality in Columbia undermines economic growth through the productivity channel, after applying a growth accounting calculus. Indeed, the sources-of-growth decomposition shows that this reversal can be accounted entirely by changes in productivity induced by an increase in criminality.

Pinotti (2011) compares the post-war economic growth of two different regions (treated group) in southern Italy exposed to the presence of mafia organizations after the 1970’s with a hypothetical control group, using synthetic control methods. The comparison of actual and counterfactual development shows that the presence of mafia mitigates regional GDP per capita by 16 per cent, at the same time as murders increase sharply for the synthetic control group.

Gaibullov and Sandler (2008) measured the impact of domestic and transnational terrorism on income per capita growth for 1971-2004 in a panel of 18 Western European countries and concluded that there is a negative but significant relationship between crime variables (economic costs of domestic and transnational crimes) and income per capita growth.

Gupta (2004) analyzes the consequences of conflict index on economic growth within a three-equation cross section structural model for a panel of countries. He finds that conflict index has no direct effect on economic growth, but has an indirect effect by increasing defense spending share, which lowers economic growth.

Peri (2004), using a large data set from 1951 to 1991, shows that annual per capita income growth in Italy is negatively affected by murder.

Narayan and Smyth (2004) used the Granger Causality Test within an Auto Regressive Distributed Lag (ARDL) Model to determine the relationship between different crime typologies (arms trafficking and human trafficking) on the one hand and real wage rate and unemployment in Australia, on the other. The study finds that proliferation of arms and human trafficking deteriorated unemployment and wage rate. The study links increase in participation in crime to proliferation of arms, which breeds unemployment as the number of prison sentences increases. This study aligns with the Time Allocation Model.

Mauro et al. (2007) test the link between unemployment, economic growth and human trafficking using Italian regional data. Employing Ordinary Least Square technique, the study found that human trafficking impacted negatively on the GDP of the economy as well as increase unemployment rate. The influx of illegal immigrants into Italy for prostitution and pornography put a downward pressure on existing facilities and thus cause increase in government spending on infrastructure and other social services.

Chen (2009) examines the long-run and causal relationships among cyber crime, unemployment and income for Taiwan, using a Bounce Test Approach. The study finds significant negative relationship between cyber crime, income and unemployment in Taiwan with a unidirectional effect of crime on economic variables.

Detotto and Pulina (2009) applied an ARDL Model from 1970 to 2004 for Italy to assess the relationship between deterrence indicators, multiple crime offences and economic performance. They conclude that cyber crime affected the GNP of the economy negatively while deterrence indicators did not substantially reduce the number of cyber crimes committed within the period.

Baharom and Habibullah (2009) examined the relationship between real gross national product (GNP) and cyber crime. Applying an ARDL model for Malaysia, the study shows that cyber crime has negative but significant impact on the GNP of the country. They, therefore, advocated for strong and water-tight security code for banks and stiffer penalty for those found culpable.

Detotto and Otranto (2010) presented an empirical analysis of macroeconomic consequences of criminal activity (murder) in Italy from 1979 to 2002. Dealing with an AR model incarnated in a state space model, a time-varying parameter approach was employed to measure the short-run impact of criminality on real GDP.

Results show that murder has a strong permanent component which has a significant negative impact on economic performance.

Adewale (2011) discovered a strong significant negative relationship between economic crime and output growth in Nigeria. He undertook an empirical investigation of the relationship between a number of key variables in Nigeria. After carrying out a test of stationary and co integration properties on the variables, he further estimated the econometric parameters of the variables which included Gross Domestic Product (GDP) as the dependent variable and Gross Capital Formation (GCF), Money Supply (MS), Public Domestic Investment (PINV), Corruption Perception Index (CPI), bank fraud, External Debt (EXTD) and Unemployment Rate (UNEMPL) as the explanatory variables, and concluded that economic crime has a crowding-out effect on growth within the period of 1996 to 2009. The time points are small to allow for generalizations of this nature. Again, the use of corruption perception index as a proxy for economic crime may hide other characteristics of economic crime and so hamper robust econometric analysis.

Fabayo, Posu and Obisanya (2011), in their study analyzed the consequences of economic crime on investment in Nigeria using the Ordinary Least Square technique. They used the annual corruption perception index between the period 1996 and 2010 as proxy for economic crimes. Their study revealed that low Corruption Perception Index ranking on Nigeria, which implies high level of corruption, leads to low investment and thus low economic growth in Nigeria. The time points are small to allow for generalizations of this nature. Again, the use of corruption perception index as a proxy for economic crime may hide other characteristics of economic crime and so hamper robust econometric analysis.

In another related study which focuses on the relationship between economic crime and development, Akindele (2005) undertook an empirical investigation of the relationship between a number of key variables in Nigeria. Estimating a modified production function that includes labour, capital and political instability, corruption index as variables found that there exists a strong significant negative relationship between economic crime and development. The time points considered here are too short for such conclusions to be drawn. The use of OLS linear regression without investigating the nature of the relationship between economic crimes and economic growth will definitely yield misleading result.

Nageri et al. (2013) while adopting Ordinary Least Square (OLS) linear technique tested the hypothesis that corruption perception index affects economic development (GDP) and found the result to be statistically significant, meaning that Corruption Perception Index (CPI), a proxy for economic crime in this research negatively affects economic development. On the other hand, the null hypotheses of Corruption Rank (CR) and Relative Corruption Ranking (RCR) of Nigeria among countries under review were not accepted meaning that the relative position of Nigeria among countries under review and Nigeria's rank on corruption cadre is also statistically significant. The proxy for economic crime is a subjective variable and may not be an adequate measure of economic crime since they depend largely on the perceptions of people.

### 3. Model Specification and Analytical Techniques

Different models can be used to estimate the relationship between economic crimes and economic growth. Ahmad et al. (2012) adopted the standard production function, which extends Solow's original approach to growth accounting process while Detotto et al. (2010) adopted OLS technique incarnated in a State Space Model enabling the capture of time-varying elasticity coefficient of crime on growth. The point of divergence of the present study from that used by Detotto et al. (2010) is that the present study used economic crimes (Illicit Financial Outflows as proxy) instead of murder as one of the explanatory variables explaining economic growth.

Detotto et al. (2010) observed that a quick way of determining the nature of the relationship between two variables is to plot their scatter diagram. Figure 4 plots the scatter diagram of Illicit Financial Outflows and RGDP for Nigeria over 1970 through 2013.

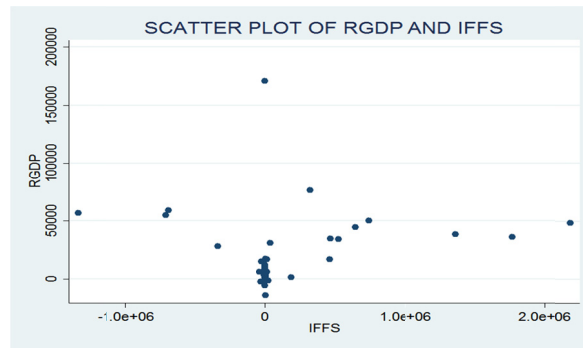


Figure 4. Scatter plot of IFFs and RGDP

Source: Authors estimation using data from CBN and Global Financial Integrity.

Figure 4 above does not show a clear linear combination. Furthermore, Gujarati and Porter (2009) posit that plotting residuals versus the fitted values of the dependent variable dictates the possibility of nonlinearity that your analysis has ignored. Figure 5 below represents a diagram of fitted values of RGDP and residuals with no easily identifiable linear relationship, thus reinforcing the possibility of nonlinearity.

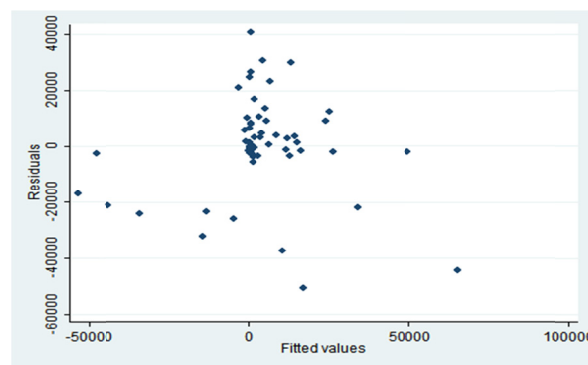


Figure 5. Fitted values of RGDP and Residuals

Source: Authors estimation using data from CBN and Global Financial Integrity.

Gujarati et al. (2009), however, stated that non-linear models, in some special cases, can be linearised through logarithmic transformation which is why logarithm transformation is called non-linear transformation. Therefore, taking a logarithm transformation of the parameters and plotting it in a scatter diagram portrays a linear combination as can be seen in Figure 6.

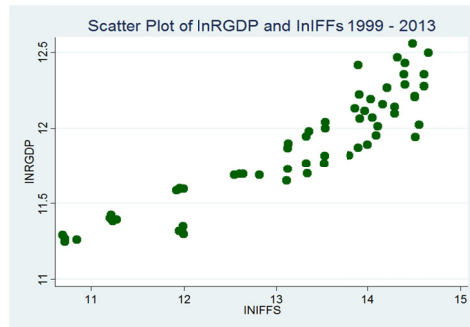


Figure 6. Scatter plot of log of IFFs and RGDP

Source: Authors estimation using data from CBN and Global Financial Integrity.

The Figure 6 above implies that under some special cases but not in all cases, a non-linear model may be transformed to a linear model. This transformation, therefore, permits the use of OLS linear regression, permitting comparison with other models.

Because of the possibility of economic crimes having non-linear relationship with economic growth, the functional expression which captures this non-linear relationship specified as a linear function is stated below:

$$RGDP = f(\text{Household Consumption Expenditure, Gross Fixed Capital Formation, Government Expenditure, Net exports, Illicit Financial Outflows}) \quad (1)$$

The mathematical/algebraic representation of the model is stated as:

MODEL 1:

$$RGDP = \beta_0 + \beta_1 HCON + \beta_2 GCF + \beta_3 GEXP + \beta_4 NX - \beta_5 IFFs + \xi. \quad (2)$$

Where:

RGDP = Real Gross Domestic Product.

HCON = Household Consumption expenditure.

GFCF = Gross Fixed Capital Formation.

GEXP = Government expenditure.

NX = Net Exports (Exports minus Imports).

IFFs = Illicit Financial Outflows.

$\beta_0$  = Intercept.

$\beta_1$  to  $\beta_5$  = Parameters to be estimated.

$\xi$  = Residual Terms.

n = any power except 1.

The logarithmic transformation of Equation (2) specified in Equation (3) below permits the linearization of the non-linear parameters of the model. Figure 5 and 6 provide the rationale.

$$\ln RGDP_t = \beta_0 + \sum \beta_1 \ln HCON + \sum \beta_2 \ln GFCF + \sum \beta_3 \ln GEXP + \sum \beta_4 \ln NX - \sum \beta_5 \ln IFFs + \xi_t \quad (3)$$

To verify if long-run equilibrium relationship exists and to verify if this relationship is linked with the short-run dynamic adjustment mechanism that describes how the series react when they move out of long-run equilibrium, the researcher explored cointegration and error correction models.

#### ● Cointegration

Cointegration is an econometric concept which mimics the existence of a long-run equilibrium among economic time series. If two or more series are themselves nonstationary, but a linear combination of them is stationary, then they are said to be cointegrated (Wei, 2006). Rajab (2011) observed that we should be concerned about cointegration because it is a possible solution to nonstationarity found in many economic time series, and if time series are nonstationary, the assumptions upon which OLS estimation rest are violated, rendering its application inappropriate. Cointegrated variables will never move far apart, and will be attracted to their long-run relationship.

Testing for cointegration implies testing for the existence of such a long-run relationship between economic variables. This study considered only the Johansen's procedure for cointegration among other tests such as the Engle-Granger method commonly known as the two-step estimation procedure and the Phillips-Ouliaris method.

#### ● Johansen's Procedure

Johansen's procedure builds cointegrated variables directly on maximum likelihood estimation instead of relying on OLS estimation. This procedure relies heavily on the relationship between the rank of a matrix and its characteristic roots. Johansen derived the maximum likelihood estimation using sequential tests for determining the number of cointegrating vectors. Consequently, he proposes two different likelihood ratio tests namely: the trace test and the maximum eigen value test.

Stata 11 uses the trace statistic and compares it with the critical test statistic. Cointegrating vector exists if the trace statistic is greater than the critical test statistic.

This procedure has the advantage over the Engle-Granger and the Phillips-Ouliaris methods in that it can estimate more than one cointegrating relationship, if the data set contains two or more time series.

The long run equation of the model is stated below:

$$\pi_t = \ln \text{RGDP}_t - \psi_0 - \sum \psi_i \ln \text{IFF}_{t-i} \quad (4)$$

Where:

$\pi_t$  is the equilibrium error term.  $\Psi_i$  is the long-run response (change of  $\text{RGDP}_t$  with respect to a change in  $\text{IFF}_{t-i}$ ).

#### ● Error Correction Model (ECM)

An error correction model is not a model that corrects the error in another model. ECMs are a category of multiple time series models that directly estimate the speed at which dependent variable, say, Y returns to equilibrium after a change in an independent variable, say, X. ECM links the long-run equilibrium relationship implied by cointegration with the short-run dynamic adjustment mechanism that describes how the two series react when they move out of long-run equilibrium. Although it may be possible to estimate the long-run or cointegrating relationship, economic systems are rarely in equilibrium as they are affected by institutional and/or structural changes that might be temporary or permanent. Since equilibrium is rarely observed, the short-run evolution of variables (short-run dynamic adjustment) is important.

The error correction model of this study is stated below:

$$\Delta \text{RGDP}_t = \alpha + \beta_1 \Delta \text{IFF}_{t-i} - \beta_2 \text{ECT}_{t-i} + \varepsilon_t \quad (5)$$

Where :

$\beta_1$  is the short-run effect (called the impact multiplier) that measures the immediate effect that a change in  $\text{IFF}_{t-i}$  will have on  $\text{RGDP}_t$ . The  $\beta_2$  parameter, measures the adjustment effect (also called the feedback effect): it indicates how much of the disequilibrium is being corrected, i.e. the measure to which any disequilibrium in a previous period affects any adjustment in  $\text{RGDP}_t$ .

Model 2: The State Space Model.

Although, in some cases, non-linear parameters could be transformed to linear parameters, however, as pointed out by Dettoto et al. (2010), when a time series is non-linear and subject to a regime change, a time varying parameter model can be more appropriate. The term 'State Space' originated in 1960 in the field of control engineering. It was employed to solve a broad range of dynamic systems problems. It is used to capture the dynamics of an observed vector in terms of a possibly unobserved vector known as the state vector. The period under review was subject to a number of regime changes. Model 2 is applied to see if it can explain more the nature of the relationship between economic crimes and the Nigerian economy.

Specifically, the State-Space Model is stated in this form:

$$\text{RGDP}_t = \alpha_0 + (\tilde{\eta} + \delta t) \text{IFF}_{t-i} + \zeta_t \quad (6)$$

Where:

$\text{RGDP}_t$  = the first differences of the logarithms of the RGDP at time.

$\alpha_0$  = the intercept.

$\text{IFF}_{t-i}$  = the logarithm of IFFs rate at time t.

$\zeta_t$  = the normally distributed error term at time t, with mean 0 and variance  $\sigma^2$ .

The coefficient of IFFst can be split into two different parts: the steady-state coefficient  $\bar{\eta}$  and the variation with respect to  $\bar{\eta}$  at time  $t$ , caught by  $\delta t$ . This is exactly what permits the modeling of a time-varying elasticity coefficient of IFFs variable. This coefficient would be specified as:

$$\mathcal{A}_t = \bar{\eta} + \delta t \quad (7)$$

The dynamics of  $\delta t$  is represented by the equations below:

$$\delta t = \gamma \delta t - 1 + \sigma t \quad (8)$$

Where:

$\gamma$  = the coefficient of the state equation (measuring the inertia intensity of  $\delta t$  across time).

$\sigma t$  = normally distributed error term at time  $t$ .

Note that the steady-state coefficient ( $\bar{\eta}$ ) measures the effect a change in IFFs will have on RGDP while  $\delta t$  measures the speed of change in RGDP caused by IFFs along time.

The state equation (8) is determined by an AR (1) process. Additionally, the disturbance term of equation (8), is assumed to be serially independent. Thus, the model is based on a two-layer process. Firstly, an observed process (6) represented by: RGDP<sub>t</sub> and IFFst and secondly an unobserved process/state equation (8) of the regression coefficient,  $\delta t$ . Equations (6) and (8) constitute a particular kind of state space model that can be estimated using a specific algorithm (filter) that permits the researcher to maximize a likelihood function. This algorithm is called the Kalman Filter.

### 3.1 Method of Data Analysis

The estimation techniques adopted in this work are the Ordinary Least Squares (OLS) and State Space Methods. The researcher chose these methods to ensure deeper understanding and robust econometric analysis. In addition to the some optimal properties, which is the Best Linear Unbiased Estimator (BLUE) possessed by OLS with its computational procedure fairly simple as compared with other econometric techniques, SSM does not require data to be stationary and this eliminates a problem on which Box-Jenkins Theory offers only minimal guidance. Furthermore, SSM deals with missing and irregular spaced observations in a straightforward way while incorporating certain desirable features such as interventions, breakpoints and regression effects easily and naturally with direct interpretations while its time-varying component adds forecasting power to the model.

Impulse Response Function (IRF) and variance decomposition were also used to explain the effect on other variables of innovation in any single variable of the model. E-views and STATA 11 statistical software packages were used to estimate the results of this study.

## 4. Data Presentation and Analysis

### 4.1 Data Presentation

Because of the need to avoid spuriousness results, the time series data were first subjected to unit root test using Augmented-Dickey Fuller Test. The outcome of the unit root test is presented in Table 2 below:

Table 2. Unit root test result

Variables	Test Statistic	Critical Adf	Level of Significance	Order of Integration
RGDP	-7.980	-3.569	1%	i(1)*
HCON	-8.661	-3.569	1%	i(i)*
GFCF	-14.353	-3.569	1%	i(1)*
GCON	-5.993	-3.569	1%	i(1)*
NX	-11.717	-3.569	1%	i(i)*
IFFS	-11.040	-3.569	1%	i(1)*

Source: Researcher's Compilation.

Note. \*Stationary at 1st difference.

The result of the unit root test above showed that all the variables have unit root problem. However, taking a first difference of all the variables eliminated their unit root problems. Having achieved stationarity at first difference for all the variables, the next step is to determine if the variables are cointegrated and so do move together in the long-run.

### ● Cointegration Relationship

The cointegration test result presented in Table 3, shows that there is only one cointegrating vector. This implies that the variables have long run relationship and there is only one way they relate in the future. This long run relationship is further determined through a long run regression analysis.

Table 3. Cointegration test

Johansen tests for cointegration					
Trend: constant Number of obs = 58					
Sample: 1999q3-2013q4 Lags = 2					
rank	parms	LL	Maximum eigen value	Trace statistic	5% critical value
0	42	-4053.8661		113.2893	94.15
1	53	-4029.8958	0.56245	65.3488*	68.52
2	62	-4017.7367	0.34248	41.0305	47.21
3	69	-4006.7406	0.31558	19.0383	29.68
4	74	-4001.2981	0.17111	8.1533	15.41
5	77	-3997.5169	0.12224	0.5910	3.76
6	78	-3997.2215	0.01014		

Source: Researcher's Compilation from Stata 11.

### ● Cointegration Regression

The table below is a summary of the cointegration regression output.

Table 4. Summary of cointegration regression result

Variables	Beta Coefficients	t-Statistic	Std. Error
HCON	0.30	2.93	0.13
GFCF	-0.15	-1.29	0.48
GCON	0.20	2.10	0.02
NX	0.02	0.17	0.17
IFFs	-0.59	-5.27	0.01
Adjusted R <sup>2</sup>	0.49		
F-Stat	12.14	F-Prob: 0.00	
T-Table	1.62		
F-Table	2.45		

Source: researcher's compilation from stata 11.

### 4.2 Data Analysis

The result presented in Table 4 above showed that only household consumption, government consumption expenditure and illicit financial outflows are statistically significant in the long run. This conclusion is drawn because the critical t-values corresponding to these variables are greater than their t-Table values. This implies that changes in RGDP are explained by household consumption, government and illicit financial outflows only. It, therefore, follows that GFCF and NX are not statistically significant and do not contribute to changes in RGDP.

Similarly, because the critical F is greater than the table F, the entire model is significant.

The adjusted R<sup>2</sup> shows that only 49 per cent of the changes in RGDP are explained by HCON, GCON and IFFs while 51% is explained by variables outside the model. However, the explanatory power of the explanatory variables is fairly moderate.

A further look at the result presented in Table 4 above also showed that the variables conform to a priori economic expectation except gross fixed capital formation, which is expected to relate with the GDP positively but comes out negative.

Furthermore, a unit change in any of the independent variables causes RGDP to change less than proportionately. This is because RGDP and other independent variables have fairly inelastic relationship. While a percentage increase in IFFs causes a decrease in RGDP by 59 per cent in the long run, on the one hand, a percentage increase in HCON will increase RGDP by 30 per cent in the long run, on the other. Similarly, a percentage increase in GCON will increase RGDP by 20 per cent respectively. However, IFFs makes the greatest impact on RGDP in the long run.

#### ● Error Correction Model (ECM)

The ECM results are presented in Table 5 and summarised below in Equation 9:

$$\Delta RGDP_t = 5211.46 - 0.005IFFs - 0.32ECT \quad (9)$$

The coefficient of the ECT is significant and correctly signed indicating that the series cannot drift too far apart and convergence is achieved in the long-run. The ECT indicates a feedback of approximately 32 per cent of the previous year's disequilibrium from long run elasticity of the explanatory variables corrected. That is, the coefficient of the error correction term measures the speed at which the level of real output adjusts to changes in the explanatory variable in an effort to achieve long run static equilibrium. It can be said, therefore, that the speed of adjustment is fair.

The coefficient of IFFs is significant in the short run since the z- statistic is within the 95 per cent confidence level. Consequently, a percentage increase in IFFs in the short run decreases RGDP by 0.5 per cent. However, the impact of IFFs on RGDP is infinitesimal in the short run. GCON accounts for about 31 per cent of the changes noticed in RGDP in the short run.

Table 5. Error correction model

#### Cointegrating equations

Equation	Parms	chi2	P>chi2
-----			
_ce1	5	42.41703	0.0000
_ce2	5	292.8852	0.0000
-----			

Identification: beta is exactly identified

Johansen normalization restrictions imposed						
beta	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
_ce1	1	.	.	.	.	.
rgdp						
D1.						
hcon	-2.78e-17	.	.	.	.	.
D1.						
gfcf	1.121234	.3204506	-3.50	0.000	-1.749305	-.4931621
D1.						
gcon	.3144276	.1296178	-2.43	0.015	-.5684737	.6038140
D1						
nx	.0617399	.0285772	2.16	0.031	.0672196	.1177503
D1						
Iffs	-.0051991	.0053369	-1.97	0.043	-.0050614	.0156591
D1						
res	-.3152583	.0597026	5.28	0.000	.1982435	.4322732
cons	-5211.467	.	.	.	.	.

Source: Researcher's Compilation from Stata 11.

#### ● Diagnostic Tests

The results of the diagnostic tests conducted are presented in Table 6 below:

Table 6. Results of the diagnostic tests conducted

Diagnostic Tests	Statistic	Probability
Durbin Watson Statistic for <b>Serial correlation</b>	1.9	
Breusch-Godfrey Prob. for <b>Serial correlation</b>		0.82
VIF Mean for <b>Multicollinearity</b>	1.35	
Breusch-Pagan Prob. For <b>Heteroscedasticity</b>		0.10
Jarque-Bera Statistic for <b>Normality Test</b>	0.003	
Jarque-Bera Prob		0.94
Ramsey Reset F-Stat. for <b>Mis-specification test</b>	7.33	0.086

Source: Researcher's Compilation from Stata 11.

As can be observed from the table above, the diagnostic tests are all good enabling robust analysis.

#### ● Causality Test

The summary of the causality test result in Table 7. The result shows that IFFs Granger causes RGDP while RGDP Granger causes IFFs. Furthermore, GCON Granger causes RGDP while RGDP does not Granger cause GCON.

Table 7. Summary of causality test result

Null Hypothesis:	Obs	F-Statistic	Probability
GCON does not Granger Cause RGDP	58	8.47213	0.00064
RGDP does not Granger Cause GCON		0.36199	0.69799
IFFS does not Granger Cause RGDP	58	4.81149	0.01202
RGDP does not Granger Cause IFFS		3.48957	0.03770

Source: Researcher's Compilation from Stata 11.

#### ● Variance Decomposition Analysis

An examination of the short-run dynamic properties of economic growth is further supplemented by forecast error variance decomposition. More importantly, Table 8 shows the fraction of the forecast error variance for each variable that is attributed to its own innovations and to innovations in another variable. Table 8 shows that shocks to GCON is the predominant source of variation in GDP forecast errors, ranging from 87 per cent to 92 per cent over the ten-quarter horizon. GDP own shocks constitute the second predominant source of variation in GDP forecast errors. The variation ranged from 100 per cent to 4 percent over the ten-quarter horizon. GFCF and NX constitute the least source of variation in GDP after IFFs.

Table 8. Variance decomposition

Variance Decomposition of RGDP:							
Period	S.E.	RGDP	HCON	GFCF	GCON	NX	IFFS
1	8150.323	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	10898.47	80.19994	0.346399	0.179914	3.578703	0.226427	15.46862
3	43816.41	9.115895	1.631220	0.618097	87.63715	0.026944	0.970689
4	74165.46	6.608164	1.734668	0.606469	90.41289	0.097346	0.540461
5	106128.3	4.915531	3.894917	0.297045	89.35878	0.382670	1.151057
6	167813.9	5.025259	1.557776	1.554341	91.05276	0.289848	0.520015
7	450478.0	5.219808	0.975799	0.220881	93.11682	0.236551	0.230145
8	1041976.0	6.298163	2.163475	0.051853	90.90485	0.057615	0.524041
9	1168828.0	7.108410	3.889581	0.808017	87.15325	0.116564	0.924181
10	1914671.0	4.626134	1.455660	0.762241	92.100551	0.691616	0.363834

Source: Researcher's Compilation from Stata 11.

### ● Impulse Response Function

The result of impulse response functions of the GDP model is documented on Table 9. The result shows that innovations in IFFs depress RGDP in the short run except in periods 1 and 2 respectively. Both GCON and HCON contribute positively to RGDP in the short run respectively. Nevertheless, RGDP responds the strongest to innovations in GCON.

Table 9. Impulse response function

Response of RGDP:						
Period	RGDP	HCON	GFCF	GCON	NX	IFFS
1	8150.323	0.000000	0.000000	0.000000	0.000000	0.000000
2	5369.446	-641.4365	462.2726	2061.713	518.5959	4286.385
3	-8930.585	-5559.316	-3413.652	40966.76	-498.3395	512.7876
4	-13728.40	-8006.137	4635.968	57364.17	-2199.379	-3330.481
5	-13790.00	18527.75	-312.9452	71354.76	6143.807	-9995.898
6	29352.04	12.56889	20106.45	124808.5	6206.822	-4098.536
7	95798.69	39261.95	3241.834	404129.3	19960.16	-17905.03
8	240390.2	146659.3	10711.75	-893310.7	-12062.30	-72267.24
9	169505.5	172187.9	-102351.4	-451314.7	-31095.21	-83283.77
10	-269221.6	15038.38	-130018.0	1478418	-154149.1	-26687.95

Source: Researcher's Compilation from Stata 11.

### Model 2: The State Space Model (SSM).

To detect the effect of economic crimes on the Nigerian economy, we proposed a State Space Model, with the variable representing economic crimes as the only explicative variable. Table 10 is the summary of the State Space result.

Table 10. Summary of the state space result

Variables	Coefficients	Std. Error	P> z
$\alpha_i$ (AR Coefficient)	0.98	0.03	0.00
(observed)	-1.50	1329.92	0.031
$\gamma$ (unobserved)	0.56	0.56	0.034
$\delta_t$ (variation)	1.09	1939.56	0.041
Log Likelihood Function	-89.009		
Wald Chi	1583.30		0.00

Source: Researcher's Compilation from Stata 11.

The table above reports the Log-Likelihood Function at the maximum (Kalman Filter) and gives the result of the Wald Test against the null hypothesis that the coefficients on all the independent variables, state variables and lagged state variables are zero. The Wald Test is significant warranting the rejection of the null hypothesis at all conventional levels.

Because the estimated mean ( $\bar{\eta} = -1.50$ ) of the differenced series is smaller in magnitude than its standard error (1329.92), this indicates that there is no deterministic linear trend in the series suggesting that the model is suitable for long run analysis. Furthermore, a percentage increase in non-linear economic crime variable will decrease RGDP by 150 per cent.

The parameter of the state equation,  $\delta_t = 1.09$  indicates a certain persistence of the crime coefficient. In other words, economic crimes effect exhibits low variation along time.

However, the evolution of the time-varying component of economic crimes coefficient  $\gamma = 0.56$ , indicates that almost 56 per cent of  $\delta_t$  is influenced by its past value  $\delta_{t-1}$ , giving a relatively high significant inertia to the evolution of the time-varying component of economic crimes coefficient. This is represented in Equation 34 below.

$$\delta_t = 0.56\delta_{t-1} + \sigma_t \quad (10)$$

## 5. Conclusion

The study sought to investigate the impact of economic crimes on the Nigerian economy. In doing this, the nature of the relationship between economic crimes and economic growth was found to be non-linear with significant long-run relationship. Economic crime variable was found to be the most significant of all the variables of the model for economic growth and so deserves serious attention more than it has received in the recent past. Therefore, any nation that allows economic crimes to thrive will pay dearly for it through an economy of highly impoverished citizens which in turn diminishes the ability of future generations to sustain themselves. Government is advised to pursue vigorously industrial growth as a policy to addressing youth unemployment, reduce poverty and income inequality. However, to achieve this, government must deliver critical infrastructure (power, road etc) that creates the enabling environment for industrial growth. Government should make this objective one of its top priorities so that economic offenders could be positively engaged and turn their minds away from economic crimes. This will ensure effective reduction of economic crimes in Nigeria.

In the same vein, since economic crimes and economic growth have non-linear relationship and also share a bi-directional causal relationship, it is recommended that a matrix of policies and programmes that increase effective aggregate demand and at the same time reduce opportunities to commit economic crimes should be pursued. Engaging the youths in skill acquisition and empowerment programmes is, therefore, highly recommended. This is in addition to creating an enabling environment for small and medium scale enterprises to thrive. Finally, the education system in Nigeria must be re-organized and re-strategized in such a manner that it delivers critical knowledge and skills that will contribute in the growth of the economy by providing graduates from tertiary institutions with required skills to make them self-reliant at the end of their studies. Youths constitute the Adam Smith's large army of unemployed and are easy conduits for commission of economic crimes.

On the whole, a call for value re-orientation is advocated as all hands must be on deck to rout this deadly cancer-worm that has prevented Nigeria from taking its pride of place in the comity of nations. It is then that the national opulence will increase, which is capable of trickling down to the lowest ranks of the people.

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