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The Relationship between Unemployment, Inflation and Crime: An Application of Cointegration and Causality Analysis in Nigeria

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Abstract
The study investigates the relationship between unemployment, inflation and crime in Nigeria. The study examines the causal relationship between unemployment, inflation and crime in Nigeria for the period 1980-2011. The stationarity properties of the data and the order of integration of the data were tested using the Augmented Dickey-Fuller (ADF) test. The variables tested stationary at first differences. The Johansen approach of cointegration was applied to test for the long-run relationship among the variables. The result indicated three (3) cointegrating relations between the variables; the Granger-causality suggests that there is unidirectional causality running from unemployment and inflation to crime in Nigeria. The study concludes that unemployment in Nigeria Granger causes crime. The reason is that unemployment rate in Nigeria is a complementary indicator of income opportunities in the legal labour market. Therefore, when, unemployment rate increases the opportunities for earning income decreases which instigate the individuals to commit crime. The costs of committing crime go down for unemployed workers. The results of causality support this proposition that unemployment causes crime. The study recommends that holistic effort should be made by governments at all levels to create jobs and arrest unemployment. Nigerian government instead of employing foreigners should sponsor her citizens abroad for studies in diverse fields of study.
Keywords: Cointegration , Causality Analysis**,** Unemployment, Inflation and Crime.

1. INTRODUCTIN

One of the greatest challenges facing the Nigeria economy is unemployment and crime which has maintained a rising trend over the years. Nigeria is the most populous country in Africa and the eight in the world with a population of over 140 million people by 2006 census. With a nominal GDP of $207.11 billion and per capita income of $1,401, it has the second largest economy in Africa (Salami, 2011). As impressive as the figures above may appear, unemployment and criminality have been one of the major problems facing Nigeria. A high level of unemployment, underemployment and criminality is one of the critical socio-economic problems facing the country. While the labour force grows, with an increasing proportion of youth, employment growth is inadequate to absorb labour market entrants. As a result, youth are especially affected by unemployment which leads some youth into committing crimes.

Moreover, young people are more likely to be employed in jobs of low quality, underemployed, working long hours for low wages, engaged in dangerous work or receive only short term and/or informal employment arrangements. The inadequate employment situation of youth has a number of socio-economic, political and moral consequences. This has resulted in crimes in Nigeria which is chronic and rising. Unemployment and crime are so intertwine that one can easily confuse one for the other. Although, it is possible for one to be employed and still commit crime, this is likely to be a case of underemployment. Thus, by unemployment, it includes those underemployed. Unemployment and underemployment reflect the failure to make use of an important factor of production, labour, for fostering economic growth in Nigeria. Low returns to labour as well as high unemployment indicates crime. Crime makes it difficult to make investments in education and health that would increase a person's productivity.

The structural unemployment and widespread crime are believed to be the basis for the activities of miscreants such as militant youth in the Niger Delta and the Boko Haram in northern Nigeria which has led to declaration of state of emergency in Brono State, Adamawa State and Yobe State. This has being the major challenge of investors to come and invest in the country. It is in light of proffering solutions to the problems of unemployment and crime that this study is of interest. The objective of this paper therefore is to analyze empirically the relationship between crime and major economic factors (unemployment and inflation) in Nigeria; determine the direction of the relationship; and to recommend policy measures to help check and prevent crime rate in Nigeria.

2. LITERATURE REVIEW

Many studies have been conducted on the relationship between crime and its determinants. The results of these studies show that these various factors are responsible for promoting crime in the world. Lee (2002), examines the relationship between labour market conditions and various crime series in three Asia-Pacific countries,

Australia, Japan and South Korea. Johansen maximum likelihood cointegration and Granger causality tests were applied to time series data to see the existence of longrun equilibrium or a causal link between unemployment and crime variables. The results of the study provide a strong support for a long-run equilibrium relationship between unemployment and various crime series.

Coomer Nicole (2003), undertook a study to examine the influence of macroeconomic factors on crime. He applied OLS regression to find out the results. In his analysis, he first included unemployment, poverty, prison population, high school and college education level and income disparities as independent variables and run the regression to get the relationship. He then dropped the insignificant variables and rerun the regression and found that unemployment, inflation and poverty influence crime positively. Papps & Winkelmann (1999), investigates the relationship between unemployment and crime and range of categories of crime in New Zealand with the limitations of sixteen regions for the period of 1984-1996 by using country level and time loop data including random and fixed effect models. Unemployment and crime two variables are considered. Two way fixed effect techniques have been used, the result shows that there is a significant effect of unemployment on crime.

Raphel & Winter-Ebmer (1999), investigates the relationship between unemployment and crime by using US country data including time trends and state effect and year effect. Property crime, violent crime, prison, population, alcohol consumption, oil cost and income are the variable which is considered. OLS and SLS techniques have been used. The result shows that significantly positive effect of unemployment on property crime. The evidence of violent crime is considerably weaker. Edmark (2003), investigates the effect of unemployment on crime for the period of 1988-1999 in Swedish countries by using fixed effect including time series and country level data. Variables are avg. Income, education, social allowances population density considered. Linear and quadratic time trend techniques have been used. The result shows that unemployment has a positive and significant effect on crime.

Maria & Meloni (2004), investigate the determinants of crime by using panel data approach for the period of 1990-1999 in Argentina. Crime rate, probability of imprisonment, GDP, unemployment rate, gini Coefficient, and inequality variables are considered. Co relational technique has been used. The result shows that the effect of unemployment rate and inequality rate is significantly associated with crime rate. Foon Tang (2004), investigates the relationship between unemployment, inflation and crime rate by using annual data for the period of 1970-2006 in Malaysia. Crime rate, inflation and unemployment rate variables are considered. Bartlett Corrected trace test technique has been used. The result shows that there is a positive significant effect of inflation and unemployment rate on crime but inflation is not positively associated with crime rate in short run. Trogdon (2006), investigates the relationship between unemployment and crime in sixteen states by using country level data. Variables are per capita income, age, population (black and white) and amount of federal funding for education considered. Microsoft excel was used to run separate regression analysis. The result shows that there is a significant effect between unemployment and crime.

Gillani, Hafeez *et al* (2009), investigates the relationship between crime and its various factors such as unemployment, poverty and inflation by using time series data from 1975-2007 in Pakistan. Crime, unemployment, poverty, and inflation variables are considered. Granger causality test technique has been used to determine the result. The result shows that crime has significant effect on unemployment, poverty, and inflation. Authors recommended that major determinants of crime should address fairly to check crime rate in Pakistan.

Altindag (2009), investigates the impact of unemployment on crime by using country level data of European countries. Variables are unemployment, police force, GDP, urbanization, considered. OLS (ordinary least square) and SLS techniques have been used. The result shows that the unemployment of male with low education is more influential in driving the impact of the overall unemployment rate and crime. Lee (2009), investigates the effect of increasing unemployment on crime rate by using criminal or a worker record of crime. The effect depends upon the apprehension rate. Demographic variables are considered. The result shows that the effect of unemployment on crime is insignificant at low apprehension rate and significant at high apprehension rate. Foon Tang (2009), investigates the linkage between inflation, unemployment and crime rate in Malaysia by using annual data from 1970 to 2006. Inflation, unemployment and crime rate variables are considered. Bartlett corrected test technique have been used. The result shows that inflation and unemployment are positively related to the crime rate but inflation is not significant in short run. Kangoh Lee (2009), investigates the effect of increasing unemployment rate and crime rate, by using panel data approach in San Diego. Variables are unemployment rate, crime rate, apprehension, and unemployment insurance considered. The result shows that the effect of unemployment on crime is negative on low apprehension rate but positive on high rate of apprehension. The effect depends on apprehension rate.

Omotor (2012), investigates the determinants of crime in Nigeria, by using panel data set for the period of 2002 to 2005. Per capita income, crime rate, population density variables are considered. Ordinary least square technique has been used to determine the result. The result shows that there is a significant effect of per capita income and population density ion crime. The study shows that there is another big reason of increasing crime is poor performance of law enforcement agencies. Author recommended that performance of law enforcement

agencies as well as basic needs of population should improve so that crime should be under control.

3. METHODOLOGY

The paper aimed at determining the relationship between crime and major economic factors (unemployment and inflation) in Nigeria; and determine the direction of the relationship. The use of time series data for analysis demands the investigation of presence of unit root in the data. This is to ensure that the variables used in the regressions are not subject to spurious correlation. For this purpose, Augmented Dickey-Fuller (ADF) test is applied for the inspection of non-stationarity problem in the variables. ADF test is applied here by considering the following two kinds.

(1) With intercept.

(2) With both trend and intercept.

The Johansen co-integration test was employed to examine the long-term relationship between crime and major economic factors (unemployment and inflation) in Nigeria. Hence, if the time dependent lagged relationship between the variables exists, then the direction could be determined by applying the Granger Causality test which is one of the tests to define this relationship statistically. The estimation procedure takes the following forms:

3.1. Unit Root Test

Before estimating the cointegrating regressions, Augmented Dickey-Fuller (ADF) unit root test was employed to determine the order of integration of the series (i.e. to investigate the stationary status of each variable). Since only variables that are of the same order of integration may constitute a potential cointegrating relationship. To test for the unit root of a time series, say *X*, the Augmented Dickey Fuller unit root test is usually employed. The test is the *t*-statistic on parameter α from the following equation

$$\Delta X_t = \beta_0 + \alpha X_{t-1} + \sum_{i=1}^{k} \beta_i \Delta X_{t-i} + \varepsilon_t \quad (1)$$

where Δ is the first difference operator, β is the coefficient of the preceding observation, X_{t-1} is the immediate prior observation, ΔX_{t-i} is the differenced lagged term, k is the number of lags, β_i is the parameter to be determined and ε_t is the disturbance term.

The role of the lagged dependent variables in the augmented Dickey Fuller (ADF) regression equation (1) is to ensure that ε_t is white noise. Therefore, appropriate lag length *k* needed to be chosen. The optimal lag length (*k*) is determined by the Schwarz Information Criterion (SIC). Schwert (1987, 1989), the lag length was set equal to the integer portion of two values of ℓ, that is, ℓ_4=int$\{4(T/100)^{1/4}\}$ and ℓ_{12}=int$\{4(T/100)^{1/4}\}$, and T is the number of observations. The null hypothesis, H_0*:* X_t is *I(1),* that is, a unit root is rejected in favour of *I(0).* If α is found to be negative and statistically significantly different from zero. The computed *t*-statistic on parameter α, is compared to the critical value tabulated in MacKinnon (1991). When k = 0, we have the standard Dickey-Fuller test.

The unit root tests for the first-difference of the variables is carried using the following regression equation

$$\Delta^2 X_t = \beta_0 + \alpha \Delta X_{t-1} + \sum_{i=1}^{k} \beta_i \Delta^2 X_{t-i} + \varepsilon_t \quad (2)$$

where the null hypothesis is H_0*:*X_t is *I(2)*, that is, two unit roots which is rejected in favour of *I(1).* If α is found to be negative and statistically significantly different from zero.

3.2. Cointegration Test

After determining that the series are of the same order of integration, we test whether the linear combination of the series that are non-stationary in levels are cointegrated (i.e. possesses a long-run equilibrium relationship). This is done by employing the Johansen (1991), procedure of testing for a cointegrating relationship in a system of equations. Johansen's (1991), cointegration test is adopted to determine whether the linear combination of the series possesses a long-run equilibrium relationship. The numbers of significant cointegrating vectors in non-stationary time series are tested by using the maximum likelihood based λtrace and λmax statistics introduced by Johansen and Juselius (1990). The advantage of this test is that it utilises test statistic that can be used to evaluate cointegration relationship among a group of two or more variables. Therefore, it is a superior test as it can deal with two or more variables that may be more than one cointegrating vector in the system. Generally cointegration analysis is a technique used in the estimation of long-run equilibrium parameters in relationship with non-stationary variables.

The purpose of using this technique is to find cointegration among stationary time series. If all the variables are non stationary at level but stationary at first difference, it means that the variables can be cointegrated. The stationary linear combination is called the cointegrating equation and interpreted as a long run relationship among the variables. However, a brief discussion on the Johansen-Juselius technique is provided below. We begin with by defining a *k*-lag vector autoregressive (VAR) representation

$$X_t = \alpha + \Pi_1 X_{t-1} + \Pi_2 X_{t-2} + \cdots + \Pi_n X_{t-n} + \varepsilon_t, \ (t = 1,2,\ldots, T) \quad (3)$$

where X_t is a $n \times 1$ vector of non-stationary *I(1)* variables, α is a $n \times 1$ vector of constant terms, Π_1, Π_2... Π_n are $n \times$ k coefficient matrices and ε_t is a $n \times 1$ vector of white Gaussian noises with mean zero and finite variance. Equation (3) can be rewritten as

$$\Delta X_t = \alpha + \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + \cdots + \Gamma_{n-1} \Delta X_{t-n+1} + \Pi_n X_{t-n} + \varepsilon_t, \quad (4)$$

where $\Gamma_j = -J + \Pi_1 + \Pi_2 + ... + \Pi_j$ (j = 1,2,…, n−1) and Π is defined as

$$\Pi = -J + \Pi_1 + \Pi_2 + ... + \Pi_n \quad (5)$$

Johansen (1988) shows the coefficient matrix Π_n contains the essential information about the cointegrating or equilibrium relationship between the variables in the data set. Specifically, the rank of the matrix Π_n indicates the number of cointegrating relationships existing between the variables in X_t. In this study, for a two case variables, *Xt* = (Financial Deepening and Economic Growth) and so n=*2*. Therefore, then the hypothesis of cointegration between Financial Deepening and Economic Growth is equivalent to the hypothesis that the rank of Π_n=*1*. In other words, the rank *r* must be at most equal to *n−1*, so that $r \leq n-1$, and there are *n−r* common stochastic trends. If the *r=0*, then there are no cointegrating vectors and there are *n* stochastic trends.

The Johansen-Juselius procedure begins with the following least square estimating regressions

$$\Delta X_t = \alpha_1 + \sum_{j=1}^{n-1} \Gamma_j \Delta X_{t-j} + \varepsilon_{1t} \quad (6)$$

$$X_{t-n} = \alpha_2 + \sum_{j=1}^{n-1} \Gamma_j \Delta X_{t-j} + \varepsilon_{2t} \quad (7)$$

Define the product moment matrices of the residuals as $S_{ij} = T^{-1} \sum_{t=1}^{T} \bar{\varepsilon}_{it} \bar{\varepsilon}_{jt}$ (for *i, j=1,2*), Johansen (1988) shows that the likelihood ratio test statistic for the hypothesis of at most *r* equilibrium relationships is given by

$$-2lnQ_r = -\sum_{i=r+1}^{n} ln(1-\lambda_i) \quad (8)$$

where $\lambda_1 > \lambda_2 > \cdots \lambda_n$ are the eigenvalues that solve the following equation

$$|\lambda s_{22} - s_{21} s_{11}' s_{12}| = 0 \quad (9)$$

The eigenvalue are also called the squared canonical correlations of ε_{2t} with respect to ε_{1t}. The limiting distribution of the $-2lnQ_r$ statistic is given in terms of a *n−r* dimensional Brownian motion process, and the quantiles of the distribution are tabulated in Johansen and Juselius (1990) for *n−r=1,...,5* and in Osterwald-Lenum (1992) for *n−r=1,...10*.

Equation (8) is usually referred to as the trace test statistic which is rewritten as follows

$$L_{trace} = -T \sum_{i=r+1}^{p} ln(1-\lambda_i) \quad (10)$$

where $\lambda_{r-1,...}\lambda_p$ are the *n−r* smallest squared canonical correlation or eigenvalue. The null hypothesis is at most *r* cointegrating vectors. The other test for cointegration is the maximal eigenvalue test based on the following statistic

$$L_{max} = -T.ln(1-\lambda_{r+1}) \quad (11)$$

where λ_{r+1} is the $(r+t)^{th}$ largest squared canonical correlation or eigenvalue. The null hypothesis is *r* cointegrating vectors, against the alternative of *r+1* cointegrating vectors.

3.3. Toda-Yamamoto Causality

Toda and Yamamoto (1995), proposed causality test which is robust for cointegration and stationarity properties.They levied criticism on VECM based causality test that its results may not be correct because preliminary tests biases of cointegration and first difference stationarity can be a possible source of wrong inferences regarding causality. Following system of equations is proposed to check causality inferences under Toda-Yamamoto causality test and SUR (seemingly unrelated regression) technique is utilized to estimate the model because due to SUR estimation wald test experiences efficiency Rambaldi and Doran (1996).

$$\mathrm{UNE_t} = \alpha_1 + \sum_{i=1}^{k+d_{max}} \beta_{1i}\, \mathrm{UNE_{t-i}} + \sum_{i=1}^{k+d_{max}} \delta_{1i}\, \mathrm{INF_{t-i}} + \sum_{i=1}^{k+d_{max}} \lambda_{1i}\, \mathrm{CRI_{t-i}} + \varepsilon_{1t} \quad 12$$

$$\mathrm{INF_t} = \alpha_2 + \sum_{i=1}^{k+d_{max}} \beta_{2i}\, \mathrm{UNE_{t-i}} + \sum_{i=1}^{k+d_{max}} \delta_{2i}\, \mathrm{INF_{t-i}} + \sum_{i=1}^{k+d_{max}} \lambda_{2i}\, \mathrm{CRI_{t-i}} + \varepsilon_{2t} \quad 13$$

$$\mathrm{CRI_t} = \alpha_3 + \sum_{i=1}^{k+d_{max}} \beta_{3i}\, \mathrm{UNE_{t-i}} + \sum_{i=1}^{k+d_{max}} \delta_{3i}\, \mathrm{INF_{t-i}} + \sum_{i=1}^{k+d_{max}} \lambda_{3i}\, \mathrm{CRI_{t-i}} + \varepsilon_{3t} \quad 14$$

In order to check whether there exists a casual relationship between unemployment, inflation, and crime in first equation, null hypothesis will be: $\delta_{1i} = 0\ \forall_i \leq k$. If null hypothesis is rejected then we can infer that unemployment granger causes inflation, and crime. In a similar fashion all other possible causations can be checked. The concept of the Granger causality test is based on the notion that events in the past cannot be influenced by the events today or in future. Therefore, if *X* event occurs before event *Y*, then only event *X* can cause, event *Y*. When *X* causes *Y* and *Y* does not cause *X*, this is known as unidirectional causality. When variable *X* and *Y* are jointly determined it is known as feedback causality.

4. RESULTS

4.1. Source of Data

This study employed secondary data obtained from the Central Bank of Nigeria Annual Report and Statement of Account (various issues), National Bureau of Statistics (NBS), (2010). The time series data cover the period of 1980-2011.

4.2. Tests for Stationarity

The time series properties of the data were first examine using Augmented Dickey Fuller (ADF) test that is based on inclusion of both intercept and linear time trend and it is also performed without the trend term. AIC and SBC are used for the selection of optimal lag length in unit root test for all the variables. The data set consists of Nigerian observations on unemployment rate, inflation, and total crimes. The ADF test was carried out on the levels and first differences of all the variables. The results are reported in Table 1. The optimal lag length is important to identify the true dynamics of the model. To determine optimal lag length of VAR system, the LR, FPE, AIC, SBC, and HQ lag selection criteria are used. Therefore, the study decides to choose 3 lags in VAR. The results of selecting optimal lag length of VAR are reported in Table 2.

Table 1. Augmented Dickey Fuller (ADF) for Crime and Economic Determinants

Variable		Level	First Difference
Crime	Only Intercept	–2.03036	–5.28172*
		(0.2570)	(0.0012)
	Trend and Intercept	–2.56530	–5.17456*
		(0.1520)	(0.0002)
Unemployment	Only Intercept	–1.31546	–5.37634*
		(0.2445)	(0.0001)
	Trend and Intercept	–2.34086	–5.25504*
		(0.0570)	(0.0005)
Inflation	Only Intercept	–2.65310	–3.56651*
		(0.1054)	(0.0261)
	Trend and Intercept	–2.32635	–6.52243*
		(0.3733)	(0.0001)

*Note:*indicates variable is integrated of order I(1) at 5% level of significance. Values in parentheses are p-values.*

The results in Table 1 shows that all the variables are non stationary in levels. This can be seen by comparing the ADF test statistics with the critical values of the test statistics at 5% level of significance. These results provide a strong evidence of non stationarity of the series in Levels. Therefore, the null hypothesis is accepted and it is sufficient to conclude that there is a presence of unit root in the variables at levels. Hence, all the variables are differenced once and the ADF test were conducted on all the variables. The results indicate that all the variables are stationary at first difference. Therefore, the null hypothesis of non-stationarity is rejected. That is, they are stationary in their first differences. This implies that the variables are integrated of order one, i.e. I(1).

Table 2. selection of optimal lag length of VAR

Lag	LR	FPE	AIC	SC	HQ
0	NA	126157.2	24.12064	24.39494	22.14231
1	134.1343	1645.734	17.90640	20.75446*	20.09720
2	26.40065	1438.637	19.70502	21.32076	20.13153
3	25.53743*	1046.481*	18.98833*	21.46267	19.64680*

*Note: *indicates lag order selected by the criterion*

4.3. Johansen cointegration test

The Johansen cointegration rank test results are presented in Table 3 suggesting the existence of at most three cointegrating vectors in the system at 0.05 level. The results lead to conclude the existence of cointegration relationship between crime, unemployment, and inflation in Nigeria.

Table 3. Johansen Cointegration Test Results

Number of cointegrating vectors	Trace Statistic	C (5%)	Prob.**	λ-max Statistic	C (5%)	Prob.**
$r = 0$	92.36401*	57.57632	0.0000	69.43512*	47.57435	0.0004
$r \leq 1$	61.34588*	31.68623	0.0001	51.56360*	32.23160	0.0013
$r \leq 2$	14.67256	18.58475	0.0011	11.45792	15.35471	0.0091
$r \leq 3$	9.787684*	5.761444	0.0035	7.564590*	5.632533	0.0009

**denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug – Micheilis (1999) p-values*

Both the trace statistics and eigenvalue statistics in the Table 3 show that there is a unique long run relationship among the variables because in both cases the test shows at most three cointegrating equation at 5 percent level of significance. Thus, the Johansen cointegration test confirms the existence of a unique long run relationship among the variables; namely, crime, unemployment and inflation. So the hypothesis of zero cointegrating vector is rejected in favour of the alternative hypothesis that there are three cointegrating vectors. Therefore, the results of Table 3 confirm that all the two variables are the important determinants of crimes in Nigeria. These results

are logical because unemployment and inflation in Nigeria are serious factors that motivate people towards crime. The high level of unemployment results in scarcity of resources, which in turn motivate people to involve in criminal activities. People graduate and enter into labor market in search of job. However, when they do not get jobs, or get jobs with lower earnings, they may turn to criminal activities in order to fulfil the desire of higher earnings.

Unfortunately, the records of all these people are not present with the concerned authorities. The lack of record and high population density of unemployed people raises the probability of not being caught after committing a crime. This means that the opportunity cost of involving in criminal activities is low, which is a motivational factor for involvement in crimes. Unemployment has a very strong positive impact on crime. Our result is consistent with the work of Becker (1968), Ehrlich (1973) and Wong (1995). They concluded that unemployment is an indicator of income opportunities from legal sector. Hence, the increase in unemployment reduces income opportunities from legal sector which thereby raises the possibility of committing crime.

The second economic variable, inflation, also has positive impact on crime in case of Nigeria. Inflation has an adverse effect on the real income of an individual. Consequently, if that individual desires to keep his utility at the same level, he will have to raise his real income, which may force him to be involved in criminal activities [see, for example, Allen (1996), and Omotor (2009)].

4.4. GRANGER CAUSALITY BASED ON TODA-YAMAMOTO

The results of the Granger causality test based on Toda-Yamamoto procedure are reported in Table 4. The values in the parentheses are probability values whereas rests of the estimates are F-statistics. The results also confirm the fact that income inequality is an important determinant of crime in Nigeria.

Table 4 Granger causality test results between $\mathrm{CRI_t}$, $\mathrm{UNE_t}$, and $\mathrm{INF_t}$ Based on the Toda-Yamamoto Procedure

Dependent Variable	Modified Wald-Statistics		
	$\mathrm{CRI_t}$	$\mathrm{UNE_t}$	$\mathrm{INF_t}$
$\mathrm{CRI_t}$	–	9.45304 (0.0356)	16.3256 (0.0053)
$\mathrm{UNE_t}$	1.05156 (0.8033)	–	4.05345 (0.4562)
$\mathrm{INF_t}$	4.8362 (0.3535)	7.34365 (0.1354)	–

Note: All estimates are asymptotic Granger F-statistics. Values in parentheses are p-values.

The results indicate that there is unidirectional causality that runs from unemployment and inflation to crime. The bottom line of the discussion is that unemployment and inflation promote crime in Nigeria. In other words, crime Granger caused by unemployment and inflation in Nigeria. This shows that when people are employed they will not adopt the illegal way of earning money because they already have the money from some other legal sources. However, in Nigeria, the supply side effect is stronger which implies that when the gap between the rich and the poor widened, then the poor the poor will adopt illegal ways to earn money to become rich. Thus, we can conclude that income inequality has long term positive relationship with crime in Nigeria.

5. CONCLUSIONS

The results of the study reveal that the above mentioned economic factors have relationship with crime in Nigeria. Therefore the study conclusions that unemployment in Nigeria Granger causes crime. The reason is that unemployment rate in Nigeria is a complementary indicator of income opportunities in the legal labour market. Therefore, when, unemployment rate increases the opportunities for earning income decreases which instigate the individuals to commit crime. The costs of committing crime go down for unemployed workers. The results of causality support this proposition that unemployment causes crime.

The low income in relation to increase prices (inflation) has crime instigating effect by reducing individual's moral threshold. This situation forces people to boost their income for maintaining their existing living standards by legitimate or illegitimate means including criminal activities.

In the light of the results of this study, the following recommendations are suggested to prevent crime and reduce crime rate in Nigeria. These recommendations may help the government in formulation of policies that can be appropriate in curtailing the crime rate in Nigeria. It is therefore recommended that holistic effort should be made by governments at all levels to create jobs and arrest unemployment. Nigerian government instead of employing foreigners, should sponsor her citizens abroad for studies in divert fields of study. All the major economic determinants of crime – unemployment, inequalities, inflation etc. are needed to be adequately addressed by the policy makers to check the crime rate in the country.

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