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Determinants of Crime in Nigeria from Economic and Socioeconomic Perspectives: A Macro-Level Analysis

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Abstract: The study examined the determinants of crimes in Nigeria from economic and socioeconomic perspectives: A macro-level analysis using a time series data covering the period of 1990 to 2014. Both economic and socio-economic factors that determinant crime were included in the model. The economic factors include *GDP* per capita; male unemployment rate; female unemployment rate and poverty rate while the socioeconomic-demographic factors include higher education enrolment; urban population and rural population. The study embraces the autoregressive distributed lag (ARDL) model to empirically analyze the model since the variables were stationary at levels I(0) and first difference I(1). The empirical results in the long-run indicated that gross domestic product per capita and female unemployment rate was found to have a negative significant effect on crime rate in Nigeria while urban and rural population, male and female unemployment rate were found to have a positive significant effect on crime rate in Nigeria. Also, the results of the short-run indicated that gross domestic product per capita and higher education was found to have a negative significant effect on crime rate in Nigeria while urban population, male unemployment rate and poverty rate were found to have a positive significant effect on crime rate in Nigeria in the short-run. Therefore, for a country like Nigeria to reduce criminal activities in the country, there must be an increase in the income of the people. Also, government should invest more in education because it makes the people more rational and more risk averse and so it reduces the propensity to commit crimes. Therefore, higher education attainment will be the cure for criminal activities in Nigeria. Government should also create more jobs because high unemployment rates will compel people to commit crimes and this will increase crime rate in Nigeria. Lastly, there should be high budgetary provision towards poverty alleviation programme because higher poverty may lead to higher crimes rate due to depression or mental illness associated with being poor and this will decreases the rate of return of legal activities and more likely to increase return of illegal activities.

Keywords: Crime Rate, Economic Factor, Socioeconomic Factor, ARDL, Nigeria

1. Introduction

Crime is an activity which is against the law and the fact that the linkage between criminal activities and the socio-economic development of the society is undeniable. It is an action or omission which constitutes an offence and is punishable by law and crime is an unlawful act punishable by a state or other authority. Crime is an offence against the value system of any given society. It is usually conceived as the outcome of a multiplicity of conditions, ranging from economic, social, cultural and family [1]. Crime is an act harmful not only to some individual but also to a community, society or the state that is a public wrong. Crimes always create distortions and discomfort in every society which results in the feelings of insecurity among people of a specific society [2]. The costs and effects of crime vary among the various facets of the population and touch almost everyone in varying degrees [1]. Economists have attempted to know the reasons behind crime and this is called "economic of crime". There is no widely accepted definition of economic of crime. Economic of crime deals with the effect of incentives on criminal behavior and the possible measures to reduce crime. Economic of crimes is an illegal acts in which offenders' principal motivation appears to be economic gain [3]. This conceived of any offense in which individuals or collectivities of people

purposively act in an illegal manner in order to gain financial returns (e.g., robbery, drug selling, tax evasion, computer crime, and abuses of economic aid). Economics of crime deals with the effect of incentives on criminal behaviour and the possible measures to reduce crime. Economic models not only predict and explain the behaviour of criminals, but can also be used to describe the causes of crime and the dynamic interaction between criminals and anti-crime measures [4].

The two most mentioned economic and socioeconomic problems in recent times are crime and unemployment. In recent times, there has been a growing concern over the modestly increasing trends of violent crimes in Nigeria. For instance, murder which is a clear example of violent crimes was 1,629 in 1994. This number steadily increased to 2,120 in 2001 and climbed to a record high of 2,136 in 2003 [5]. Such a phenomenal increase of over 75 percent between 1994 and 2003 is worrisome. In 1994 statistics had it that the total number of armed robbery was estimated to be 2,044. In 2002, it rose to 3,889 which was 52 percent increase in less than a decade. Also in 2005, 5,210 cases of armed robbery were reported but in 2004, it rose to 10,762. 10,771 cases of armed robbery were reported to the police in 2006; the number steadily increased to 14,400 in 2007 and 16,312 in 2011. This is a clear rise of over 43 percent in less than 5 years. In contrast however, 16,499 cases of armed robbery were reported to the police in 2012, while in 2013, the number of reported armed robbery cases to the police fell to 14,700 (a decline of 18 percent) [6]. Cases of crimes were on the average higher during the era of military years but it has been declining since the return to civil democracy in 1999. However, armed robbery cases were more during the latter period. The decline in theft and other forms of stealing which accounted for over 60 percent of crimes in Nigeria was sharper than other forms of crimes. For example, while a total of 69,341 cases of theft were reported in 1994, this fell to 31,340 in 2003. Armed robbery cases reported in 1999 were 2,044 and increased to 3,497 in 2003. Crime is not only armed robbery but of different types and they include murders, robbery, burglary, larceny theft, motor vehicle theft that includes arson, and victimless crimes. There are some other crimes, such as bank frauds, credit card frauds, tax evasions, insurance fraud, computer crimes, cellular phone crime etc. These types of crimes are called white-collar crimes committed by a person belonging to a high social status in the course of his occupation [2].

It is true that no part of the world is without crime. Both developed and developing countries have been victim of that inequity since the birth of human being. However, this issue has become severe in least developing countries (LDCs) predominantly in Nigeria. The mass size of crimes has been meticulous due to the high unemployment, the soaring prices of food and raw materials, the increasing gap between the rich and the poor, the migration from scattered areas toward populated areas and the lack of education. Crime is not related to some specific group or community of people, but many well off and educated people are also seen to involve in the criminal behavior or activities [2]. This research work is sets to study both the economic and socioeconomic determinants of crime in Nigeria: A macro-level analysis.

2. Stylized Facts on the Trend of Crime Rate in Nigeria

Table 1 gives some crime indicators in Nigeria viz assault, murder, smuggling, stealing, armed robbery, sex offence, traffic offence, currency offence, Indian hemp, forgery, human trafficking and cultism. It was observed that assault fluctuated from its peck occurrence of 7,602 in 2007 to a minimum level of 5,491 in 2010. Except in 2011 where violent crimes like murder dwindle to 9,220, there has been a surge in its occurrence. This rose to a climax of 22,689 cases in 2010. In the same vein, smuggling activities in Nigeria has been on the rise from 6,359 reported cases in 2007 to 5,657 occurrence in 2010 but a drop to 3,933 magnitudes in 2011. Over the scope of this study, it could be seen that stealing happened in 46,740 instances in 2007 and fell to 41,496 in 2008, 34,958 in 2009, 23,868 times in 2010 and 11,504 occurrences in 2010. This is an indication that the rate of stealing has reduced drastically in Nigeria while robbery has been on the rise over time.

Likewise, armed robbery was at its peak in 2010 with 19,507 happenings and very low in 2011 with 9,193 occurrences. Sex offence was on the increase from 2007 to 2009 when it rose 4,162 cases but fell to 2,330 in 2010. Since the return of democracy in Nigeria, traffic offence has been reducing from 6,393 in 2007 to 2,206 in 2008 and later to 2,048 occurrences in 2010. However, it soars to 3,568 in 2011. Currency offence has been on the rise over time and the highest occurrences were recorded in 2011 with a figure of 3,143. Indian hemp consumption has devastating effects on the health of recipients, thus the National Drug Law Enforcement Agency (NDLEA) prohibit its consumption. The crime of Indian hemp was 11,635 in 2007 and fell to 4,777 in 2008 after which it increases to 5,855 in 2009 and later to 8,578 in 2010. It however fell to 5,664 in 2011. Human trafficking has been fluctuating overtime and it was very low in 2008 and significantly high with 4,939 in 2007. Lastly, cultism or ritual offence was very low in 2008 (35 cases) and high in 2011 with a figure of 1,612. In the same vein, forgery had been fluctuating over the period considered with 2,616 cases in 2007 to 1,400 in 2008 and rise to 2,479 in 2009 while it fell to 1,920 in 2010 after which it increases to 2,946 in 2011.

Table 1. *Trend of Crime Indicators in Nigeria for Some Selected Years.*

	2007	2008	2009	2010	2011
Assault	7,602	5,432	5,537	5,491	6,001
Murder	10,467	11,058	11,419	22,689	9,220
Smuggling	6,359	1,344	2,164	5,657	3,933
Stealing	46,740	41,496	34,958	23,868	11,504
Robbery	8,594	16,567	16,127	19,298	8,083
Armed robbery	10,774	17,517	14,682	19,507	9,193

	2007	2008	2009	2010	2011
Sex offence	3,542	3,562	4,162	2,330	4,008
Traffic offence	6,393	2,206	2,651	2,048	3,568
Currency offence	644	516	1,593	2,695	3,143
Indian hemp	11,635	4,777	5,855	8,578	5,664
Forgery	2,616	1,400	2,479	1,920	2,946
Human trafficking	4,939	35	1,890	3,815	3,533
Cultism/ritual	1,378	83	1,447	1,284	1,612

Source: Author Computation from National Bureau of Statistics (NBS, 2014)

Also, the trend of crime classified by religion in Nigeria is given below in Table 2. It was observed that crime committed by people that practice Christianity has been on the increase up to 2010 but fell in 2011. Similarly, crime committed by Islamic faithful increases from 2007 to 2009 and dwindled from 2010 to 2011. Other religion that is not mentioned in this study occupied the next position after Islam but it has been fluctuating over time. Furthermore, traditional religion partakers' crime rate was on the increase from 2008 till the 2011. The crimes committed by this group were highest in 2007 (20,823). Both crimes committed by Christian and others religion faithful were very high in 2010. All these have some implications for the socio-economic and development of Nigeria.

Table 2. *Trend of Crime Classified by Religion in Nigeria.*

	2007	2008	2009	2010	2011
Christian	57,675	62,250	74,420	78,739	46,706
Islam	48,113	54,441	65,084	50,867	35,316
Traditional	20,823	4,931	5,894	14,707	16,270
Atheist	7,307	769	919	6,790	6,037
Others	25,500	8,393	10,034	200,778	27,203

Source: Author Computation from National Bureau of Statistics (NBS, 2014)

3. Literature Review

The swift increase in criminal activities in various parts of the world has generated the economics of crimes. There are enormous volume of theoretical and empirical literature that have explained the determinants of crimes in developed and developing countries. A number of studies have been carried out in order to know the determinants of crime rates. For example, Khan et al [2] examined the socio-economic determinants of crime in Pakistan: New evidence on an old debate from 1972 to 2011. The findings from the result indicated that a positive relationship between crime rates and unemployment rate in Pakistan. Higher unemployment diminishes the rate of return of legal activities, and is more likely to increase the return of illegal activities. There was a significant negative relationship between the crime rates and the higher education. The study further assessed that GDP per capita leads to higher crime rates in the long-run but to lower rates in the short-run. Finally, there was a positive relationship between the crime rates and poverty in the long-run but there is a negative relationship in the short-run. Also, Ghani [3] examined urban crime between Malaysia and Nigeria: A comparative study and the result indicated that criminal activities in urban areas have become more terrifying in many parts of the world. The last three decades have shown an aggravated toll of urban crimes across the globe which is not peculiar to either developing or developed countries. Both suffer the same providence. In any given urban areas where crime is prevalent, it creates social predicament to the society such as safety of property, lives are threaten, people will be living in fear in their respective living environment and generate low quality of life due to the havoc it creates socially and economically. As mentioned earlier, managing urban crime has become a basis of concern and various controlling and preventive measures have to be applied to combat crimes. The best approach to crime management is primarily prevention strategy rather than waging war against criminal activities.

In the same manner, Anthony [7] examined the social factors affecting effective crime prevention and control in Nigeria. This study revealed that the security agencies are inadequately equipped and motivated, coupled with poverty, unemployment and the breakdown of family values among others have made crime prevention and control a difficult task. Lobonț et al [8] investigated the effect of socioeconomic factors on crime rates in Romania: A macro-level analysis. Results indicate that lagged crime rate, clearance rate, urbanization rate and fraction of foreigners are positively correlated to crime rates. Property crimes are better explained by socio-economic variables (youth unemployment rate and education). Levitt and Miles [9] examined the economic contributions to the understanding of crime. The studies generally found that increases in police and greater incarceration lead to reduced crime. The death penalty, as currently used in the United States, does not appear to lower crime. We also review the evidence on three other crime-related debates in which economists have played a central role: racial profiling, concealed weapons laws, and the impact of legalized abortion. Buonanno and Leonida [10] examined non-linearity between crime and education: Evidence from Italian regions. The empirical results suggested that crime was negatively correlated to education for low and medium levels of education, and that criminality displays persistence over time. However, as expected, crime is positively correlated to education for high levels of education, a result that seems to be driven by a white collar effect.

Also, Clear [11] examined the effects of high imprisonment rates on communities: There are considerable methodological challenges in trying to link the consequences of concentrated incarceration to reduced public safety. Findings from studies are mixed yet, as empirical evidence grows of the negative collateral consequences of concentrated incarceration, the likelihood that concentrated incarceration is criminogenic in its effects on those communities becomes stronger. No well-established or proven strategy exists for combating the effects of

concentrated incarceration on communities. Rath [12] examined socio-economic condition as a contributing factor for criminality of women prisoners in Odisha by using 217 respondents in the state. The result of the study indicated that criminality has touched almost all the sectors of the country. It has even not spared the bureaucrats, politicians, religious preachers and law executors. Hence, crime has become a major area of concern and it needs tremendous effort by the State agency to fight against such criminality and to revert the criminals back into the society streamlining them with social values and responsibilities.

Furthermore, Petersilia [13] examined when prisoners return to the community, political, economic, and social consequences. The result of the findings indicated that ironically, no-parole systems also significantly undercut post release supervision when parole boards have no authority to decide who will be released, they are compelled to supervise a parolee population consisting of more serious offenders and not one of their own choosing. Sham et al [14] reviewed social structure, crime and quality of life as women travelers in Malaysian cities in a sample of 120 women in all the eight existing prison in Kisii town. The study result indicated that whether social structure had an impact towards the crime occurrence in the main urban area in Malaysian city remains an open question. A further study on this variable will help to explore the situation by tapping on the right respondent to the questionnaire pertaining the travel safety issues among the women travelers.

Beside, Dara et al [15] examined tuberculosis control in prisons: current situation and research gaps using a sample 3,395 in the South-East Region of Nigeria. The study revealed that despite being a serious cause of morbidity and mortality among incarcerated populations, many prison systems encounter a variety of challenges that hinder TB control. Murray et al [16] examined crime and violence in Brazil: Systematic review of time trends, prevalence rates and risk factors using a panel data. The findings from the study indicated that through a systematic review of the literature, it was identified 10 studies assessing the prevalence of self-reported offending in Brazil and 9 studies examining risk factors. Levels of self-reported offending seem quite high among school students in Brazil. Individual and family-level risk factors identified in Brazil are very similar to those found in high-income countries.

4. Theoretical Framework and Methodology

4.1. Theoretical Framework

The theoretical framework of this study is grounded on the standard rational choice economic model of crime by Nobel Prize laureate Becker [17]. His work radically changed the way of thinking about criminal behaviour by demonstrating that not so much mental illness and social oppressions, but individual rationality, determines whether a person engages in criminal activities or not. Becker's rational criminal decides whether or not to commit crimes based on a cost-benefit analysis aimed at maximizing utility. A common understanding of crime is that the population can be divided into two groups: good guys and bad guys. In this view, the bad guys commit crime unless they are incapacitated and the good guys are reliably law abiding. The economic model of crime shifts the focus from character to the choices available to individuals. The choice of whether to commit crime is driven by the consequences, which differ among individuals depending on the opportunities available to them. This perspective leads naturally to a presumption that deterrence works – crime rates will be inversely related to the likelihood and severity of punishment [18]. Economists focus on choices and consequences and therefore, all potential criminals have a benefit of crime X_t, which includes both the financial and any expected psychological benefits of crime. An individual committing crime faces costs from law-enforcement agencies. The severity of the punishment including fines and jail time is one part of the total cost, and the other part is the probability of getting caught. Therefore, the costs will equal the probability of punishment $Pro(\mathrm{P_t})$ times the cost of punishment (CP_t). Thus, the expected return from crime equal:

$$X_t - \Pr o(P_t)(CP_t)$$

Applying standard differentiation rule to equation (1), it implies that the number of criminals rises as $\mathrm{X_t}$ rises and declines as $Pro(\mathrm{P_t})$ or $(\mathrm{CP_t})$ rises. Thus, the individual decision to commit crime is conditional upon the following stipulation:

$$X_t - \Pr o(P_t)(CP_t) > 0$$

4.2. Model Specification

The model for this study is an adapted model which captures crime as a function of both economic and socio-economic demographic factors [1, 2, 8]. The economic variables include *GDP* per capita; male unemployment rate; female unemployment rate and poverty rate because these variables will help to measure the impact of economic factors on crime rate in Nigeria while the socioeconomic-demographic factors include higher education enrolment; urban population and rural population.

Based on the theoretical framework and the literature reviewed, the crime rate determinant model is given as:

$$CR_t = \mathrm{f}(GDPPC_t, HEE_t, UP_t, RP_t, UM_t, UF_t \ \& \ POVR_t) .$$

Where CR_t is Crime Rate (using annually aggregated number of reported crime incidence cases), $GDPPC_t$ is GDP per capita, (using PPP constant 2011 international $), HEE_t is Higher Education Enrolment (number of persons), UP_t is Urban Population (number of persons), RP_t is Rural Population (number of persons), UM_t is Unemployment Rate, Male (using % of male labour force modeled ILO estimate), UF_t is Unemployment Rate, Female (using % of female

labour force modeled ILO estimate) and $POVR_t$ is Poverty Rate (using poverty headcount ratio at $2 a day (PPP) % of population).

The linear regression of the double log model is given below.

$$LNCR_t = \beta_0 + \beta_1 LNGDPPC_t + \beta_2 LNHEE_t + \beta_3 LNUP_t + \beta_4 LNRP_t + \beta_5 UM_t + \beta_6 UF_t + \beta_7 POVR_t + e_t$$

The a priori expectation is given as.

$$\frac{dCR}{dGDPPC} < 0; \frac{dCR}{dHEE} < 0; \frac{dCR}{dUP} > 0; \frac{dCR}{dRP} > 0; \frac{dCR}{dUM} > 0; \frac{dCR}{dUF} > 0 \ \& \ \frac{dCR}{dPOBR} > 0$$

4.3. Estimation Techniques

The study embraces the autoregressive distributed lag (ARDL) model to empirically analyze the above model. According to Pesaran et al [19], the ARDL co-integration technique (bound test), compared to other multivariate co-integration methods such as [20] and [21], enables the co-integration relationship to be estimated by the ordinary least square (OLS) after determining the lag order of the model. Also, the model can accommodate regressors that are stationary at either levels I(0) or first difference I(1). In addition, the long-run and short-run parameters of the models can be simultaneously estimated [19].

$$\begin{aligned}\Delta LNCR_t = {} & \beta_0 + \beta_1 LNCR_{t-1} + \beta_2 LNGDPPC_{t-1} + \beta_3 LNHEE_{t-1} + \beta_4 LNUP_{t-1} + \beta_5 LNRP_{t-1} \\ & + \beta_6 LNUM_{t-1} + \beta_7 UF_{t-1} + \beta_8 POVR_{t-1} \\ & + \sum_{i=1}^{m} \beta_{9i} \Delta GDPPC_{t=1} + \sum_{i=1}^{m} \beta_{10i} \Delta LNHEE_{t-1} + \sum_{i=1}^{m} \beta_{11i} \Delta LNUP_{t-1} + \sum_{i=1}^{m} \beta_{12i} \Delta LNRP_{t-1} \\ & + \sum_{i=1}^{m} \beta_{13i} \Delta LNUM_{t-1} + \sum_{i=1}^{m} \beta_{14i} \Delta UF_{t-1} + \sum_{i=1}^{m} \beta_{15i} \Delta POVR_{t-1} + e_t .\end{aligned}$$

The reparameterized result gives the short-run dynamics and long run relationship of the underlying variables. The long-run relationship of the underlying variables is detected through the F-statistic (Wald test). In this approach, long-run relationship of the series was said to be established when the F-statistic exceeds the critical value band. The major advantage of this approach lies in its identification of the co-integrating vectors where there are multiple co-integrating vectors. Thus, a joint null hypothesis involving coefficients on lagged levels of crime rate i.e. H_o: $\beta_{9i} = \beta_{10i} = \beta_{11i} = \beta_{12i} = \beta_{13i} = \beta_{14i} = \beta_{15i} = 0$ against the alternative H_1: $\beta_{9i} \neq \beta_{10i} \neq \beta_{11i} \neq \beta_{12i} \neq \beta_{13i} \neq \beta_{14i} \neq \beta_{15i} \neq 0$; is tested using the Wald or F-test statistic with critical values provided by [19]. The F-test has non-standard distribution.

4.4. Data Sources

The data used for the research work are basically time series data covering 1990 to 2014, a period of twenty-five (25) years. The data for all the variables are obtained from [22, 23, 24].

5. Results and Discussions of Findings

5.1. Preliminary Analysis: Descriptive Statistics, Correlation Analysis, Unit Root Test and ARDL Bounds Test for Co-Integration

Table 3 reports the descriptive statistics and the purpose of descriptive statistics is to summarize the data which include the mean, median, maximum, minimum and standard deviation and other normality test. The crime rate was 195,898 on the average which means that crime rate in Nigeria was 195,898 yearly on the average. Crime rate has a minimum of 76,519 and a maximum value of 435,262 and it mean falls within its minimum and maximum. Furthermore, GDP per capita was $3,747.6 per year which indicate a low figure which make crime rate to increase. Also, the higher education enrolment was 988,635 yearly and this means that there is a high rate in the enrolment in education in Nigeria with enough job which in turn lead to high rate in crime in Nigeria. In the same vein, urban population is 50,516,000 which is lower than rural population of 81,432,000 while unemployment among male is higher than that of female and poverty rate in Nigeria was 59.62% which is very high to encourage more crime. Furthermore, all the variables follow within their minimum and maximum and crime rate, GDP per capita and urban population are positively skewed while higher education enrolment, rural population, male unemployment, female unemployment and poverty rate are negatively skewed and as a result of those that are negatively skewed, there median is higher than their mean. The Jarque-Bera statistic accepts the null hypothesis of normal distribution at the 10% level of significance for all the variables.

Table 3. *Descriptive Statistics.*

	CR_t	$GDPPC_t$	HEE_t	UP_t	RP_t	UM_t	UF_t	$POVR_t$
Mean	195,898	3,747.6	988,635	50,516,000	81,432,000	7.632	7.356	59.616
Median	153,238	3,030	1,032,873	47,200,000	82,100,000	7.700	7.400	61.900
Maximum	435,262	5,640	1,701,123	83,300,000	94,200,000	8.000	7.500	90.230
Minimum	76,519	2,740	124,776	28,400,000	67,200,000	7.200	7.100	18.400
Std. Dev.	115,057	1,064.7	615,454	16,871,986	8,234,365.	0.152	0.116	23.159
Skewness	1.241	0.522	-0.202	0.454	-0.154	-0.485	-0.889	-0.212
Kurtosis	2.996	1.596	1.360	1.979	1.835	4.806	2.940	1.777
Jarque-Bera	6.417	3.188	2.970	1.944	1.514	4.379	3.295	1.744
Probability	0.040	0.203	0.226	0.378	0.469	0.112	0.193	0.418
Observations	25	25	25	25	25	25	25	25

Source: Author's Computation
Note: ** imply 5% level of significance for normality using JB statistics

The degree and direction of association among the variables are shown in Table 4. Correlation analysis is use for two purpose which is to know the degree of linear association among variables and to see whether there is no multicollinearity among variables. A number of the signs tend to conform with a priori expectation while higher education enrolment do not conform. No serious problem of multicollinearity exists, as the Pairwise correlation coefficient for any of the variables does not exceed 0.80 [25].

Table 4. *Correlation Matrix.*

	$LNCR_t$	$LNGDPPC_t$	$LNHEE_t$	$LNUP_t$	$LNRP_t$	UM_t	UF_t	$POVR_t$
$LNCR_t$	1							
$LNGDPPC_t$	-0.182	1						
$LNHEE_t$	0.234	0.691	1					
$LNUP_t$	0.182	0.198	0.799	1				
$LNRP_t$	0.299	0.684	0.188	0.390	1			
UM_t	0.687	0.297	0.375	0.571	0.657	1		
UF_t	0.336	0.376	0.181	0.513	0.572	0.368	1	
$POVR_t$	0.310	0.759	0.546	0.681	0.684	0.635	0.375	1

Source: Author's Computation

To examine the stationarity of the series and time series properties of the variables in the model, the unit root test was carried out using of Augmented Dickey Fuller (ADF) test and it is presented in Table 5. The study tests for unit roots on the effect of economic and socioeconomic factors on crime rates in Nigeria and the ADF guarantee that the inference regarding the important issue of stationarity is unlikely driven by the choice of testing procedures used. The results revealed that the variables are integrated of order zero and one that is combination of I(0) and I(1) which called for autoregressive distributed lag (ARDI).

Table 5. *Unit Root Test Result using Augmented Dickey Fuller (ADF).*

Variable	Level		First Difference		Status
	ADF Critical Value	t*[p-value]	ADF Critical Value	t*[p-value]	
$LNCR_t$	-3.738	-1.873 [0.339]	-3.753	-4.288 [0.003]*	I(1)
$LNGDPPC_t$	-3.738	-0.660 [0.988]	-3.753	-3.806 [0.009]*	I(1)
$LNHEE_t$	-3.753	-1.576 [0.478]	-3.753	-10.165 [0.000]*	I(1)
$LNUP_t$	-3.769	-5.069 [0.000]*	-	-	I(0)
$LNRP_t$	-3.769	-6.849 [0.000]*	-	-	I(0)
UM_t	-2.992	-3.444 [0.019]**	-	-	I(0)
UF_t	-2.992	-3.423 [0.020]**	-	-	I(0)
$POVR_t$	-3.737	-1.961 [0.301]	-3.753	-7.353 [0.000]*	I(1)

Source: Author's Computation
Note: *, ** and *** imply 1%, 5% and 10% level of significance

Since the unit root test confirmed the combination of order zero and one that I(0) and I(1), the next step is ARDL bounds test for co-integration and result from the bounds test co-integration is presented in Table 6. The result revealed that computed F-Statistics for Wald test was 8.429. The value exceeds both the upper bounds and lower bounds critical

values for all level of significance. Therefore, the statistics test yields evidence of long-run relationship among the variables at 1%, 2.5%, 5% and 10% levels of significance in Nigeria.

Table 6. *Bounds Testing for Co-integration Analysis.*

Computed Wald F-statistic: 8.429; K = 5		
Bounds Level	**Lower Bound**	**Upper Bound**
10% critical bounds value	2.26	3.35
5% critical bounds value	2.62	3.79
2.5% critical bounds value	2.96	4.18
1% critical bounds value	3.41	4.68

Source: Author's Computation
Note: *, ** and *** imply 1%, 5% and 10% level of significance

5.2. Short-Run and Long-Run Effect of Economic and Socioeconomic Factors on Crime Rates in Nigeria

The short-run and long-run ARDL results for the effect of economic and socioeconomic factors on crime rates in Nigeria are presented in Table 7. Since the unit root test confirmed the combination of order zero and one that I(0) and I(1) and the ARDL bounds test for co-integration yield evidence of long-run relationship among variables, the short-run and long-run effect of the variables were examined.

Table 7. *Parsimonious Long-run and Short-run ARDL-ECM Results.*

	Dependent Variable: Crime Rate (CR_t)	
Variable	**Long-run**	**Short-run**
$D(LNGDPPC_t)$	-7.842 [0.000]*	-6.123 [0.000]*
$D(LNGDPPC_t(-1))$	-	-1.737 [0.111]
$D(LNHEE_t)$	-2.219 [0.847]	-0.297 [0.000]*
$D(LNHEE_t(-1))$	-	-0.255 [0.000]*
$D(LNUP_t)$	5.017 [0.006]*	2.130 [0.846]
$D(LNUP_t(-1))$	-	4.817 [0.024]**
$D(LNRP_t)$	3.833 [0.008]*	1.020 [0.101]
$D(LNRP_t(-1))$	-	1.474 [0.120]
$D(UM_t)$	1.761 [0.000]*	1.274 [0.000]*
$D(UM_t(-1))$	-	3.640 [0.000]*
$D(UF_t)$	-1.152 [0.052]***	0.226 [0.125]
$D(UF_t(-1))$	-	0.582 [0.785]
$D(POVR_t)$	1.523 [0.052]	1.840 [0.0725]*
$D(POVR_t(-1))$	-	0.001 [0.000]*
C	-4.338 [0.102]	-
$ECT_t(-1)$	-	-0.960 [0.000]*
R-Square	0.981	
Adj R-Square	0.965	
F-Statistics	60.785 [0.000]*	
Akaike info criterion (AIC)	23.100	
Schwarz criterion (SIC)	23.643	
Durbin-Watson Stat.	2.189	
Serial Correlation Test	3.273 [0.081]	
Normality Test	4.955 [0.084]	
ARCH Test	0.323 [0.728]	
Heteroskedasticity Test	0.490 [0.866]	
Ramsey RESET Test	5.758 [0.022]	

Source: Author's Computation
Note: *, ** and *** imply 1%, 5% and 10% level of significance

Empirical results indicate that there was a long-run relationship among the crimes rates and some of the explanatory variables and coefficients of the variables have theoretical expected signs except for female unemployment which does not follow suit. Also, the results show that 1% increase in gross domestic product per capita will bring about 7.842% decrease in crime rates in Nigeria. This means that as per capita income of the people increase, tendency of committing crime reduces which is the normal scenario as expected. Therefore, for a country like Nigeria to reduce criminal activities in the country, there must be an increase in the income of the people. In the same manner, 1% increase in higher education will bring about 2.219% decrease in crime rate indicating that higher education has the expected sign but insignificant in determine crime rate in Nigeria. As more education directly induces high earnings of individuals and may increase both the opportunity cost of crimes and the cost of time spent in criminal activity. Therefore, education makes the people more rational and more risk averse and so it reduces the propensity to commit crimes. This result indicates that people involved in criminal behaviour tends to be less educated and have poor economic background as compared to the non-criminals. Furthermore, urban and rural population has a positive significant effect on crime rate in Nigeria that is a 1% increase in both urban and rural population will bring about an increase of 5.017% and 3.833% respective increase in crime rate. This result indicates that more people tends to involved in criminal behavour as the population go higher. High population without resource to cater for the population in term of job and the rest will result in more criminal activities in the long run. There was a divergence between male and female unemployment rate because male unemployment rate has a positive significant effect on crime rate while female unemployment rate has a negative significant effect on crime rate. Therefore, 1% increase in male unemployment rate will bring about 1.761% increase in crime rate in Nigeria while 1% increase in female unemployment rate will bring about 1.523% decrease in crime rate in Nigeria. This means that increase in male unemployment tend to increase criminal activities because must male in Nigeria are the breadwinner who have to look for ways of providing for the family whether through legal or illegal means but this is not application to female because they will be at the receiving hand.

The short-run economic and socioeconomic determinants of crimes rate in Nigeria was done through the help of error-correction model (ECM). The ECM result indicate that gross domestic product per capita and crimes rate has a negative significant relationship with each other. This means that 1% increase in gross domestic product per capita will bring about 6.123% decrease in crime rate. This concur with the long-run finding and it indicates that more per capita income reduces crime rate drastically in Nigeria. However, the empirical results show that there was a negative significant relationship between higher education and crimes rate in Nigeria both at current and lag period. Therefore, 1% increase in higher

education will reduce crime rate by 0.297% and 0.255% at current and lag period. Therefore, higher education attainment is a cure for criminal activities in Nigeria. Urban population has a positive significant relationship with crime rate in lag period in Nigeria while rural population has the theoretical expected sign but insignificant relationship with crime rate in Nigeria but at current and lag period. Therefore, 1% increase in urban population will increase crime rate in Nigeria by 4.817% at time goes on. Furthermore, the results on the short-run strongly support the existence of significant and positive relationship between the crimes rate and male unemployment at both current and lag period while female unemployment has positive but insignificant relationship with crime rate in Nigeria. Therefore, 1% increase in male unemployment will bring about 1.274% and 3.640% increase in crime rate in Nigeria. High unemployment rates may decrease the earning opportunities for the individuals which in turn compel them to commit crimes and this makes crime rate to increase. Also, there was a negative significant relationship between crimes rate and poverty in Nigeria at both current and lag period which is in support with theoretical findings. This means that 1% increase in poverty rate increase crime rate by 1.840% and 0.001% respectively. Therefore, higher poverty may lead to higher crimes rate due to depression or mental illness associated with being poor and this will decreases the rate of return of legal activities and more likely to increase return of illegal activities. Hence, poverty is one of the major contributing factors of high crimes in Nigeria. The coefficient of error-correction term was negative and significant and evaluates that all short-run variables may converge on the long-run that is the speed of convergence was very high as 96% per year. It indicates that there was convergence which means that short-run coefficient values move to their equilibrium or stable path. Also, the value of adjusted R-squared of 96.5% shows that the model was relatively good as most of the variations are being explained by the explanatory variables and the model was free from any econometric problem through the Durbin-Watson statistics of 2.189 while the F-statistic of 60.785 [0.000] indicates that the overall model was good. The results of diagnostic test statistics confirm the absence of serial correlation, heteroscedasticity, autoregressive conditional heteroscedasticity (ARCH) in the model and the model is normally distributed.

6. Conclusion

The swift increase in criminal activities in various parts of the world has generated the economics of crimes. Crimes always create distortions and discomfort in every society which results in the feelings of insecurity among people of a specific society. The study examined the determinants of crimes in Nigeria from economic and socioeconomic factors perspectives: A macro-level analysis using a time series data covering the period of 1990 to 2014. Both economic and socio-economic factors that determinant crime were included in the model. The economic factors include *GDP* per capita; male unemployment rate; female unemployment rate and poverty rate while the socioeconomic-demographic factors include higher education enrolment; urban population and rural population. The study embraces the autoregressive distributed lag (ARDL) model to empirically analyze the model since the variables were stationary at levels I(0) and first difference I(1). The empirical results in the long-run indicated that gross domestic product per capita and female unemployment rate was found to have a negative significant effect on crime rate in Nigeria while urban and rural population, male and female unemployment rate were found to have a positive significant effect on crime rate in Nigeria. Also, the results of the short-run indicated that gross domestic product per capita and higher education was found to have a negative significant effect on crime rate in Nigeria while urban population, male unemployment rate and poverty rate were found to have a positive significant effect on crime rate in Nigeria in the short-run. Therefore, for a country like Nigeria to reduce criminal activities in the country, there must be an increase in the income of the people. Also, government should invest more in education because it makes the people more rational and more risk averse and so it reduces the propensity to commit crimes. Therefore, higher education attainment will be the cure for criminal activities in Nigeria. Government should also create more jobs because high unemployment rates will compel people to commit crimes and this will increase crime rate in Nigeria. Lastly, there should be high budgetary provision towards poverty alleviation programme because higher poverty may lead to higher crimes rate due to depression or mental illness associated with being poor and this will decreases the rate of return of legal activities and more likely to increase return of illegal activities.

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