

## **Impact of road traffic crashes on the Nigerian economy**

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### **Abstract**

*Impact of road traffic crashes on the Nigerian economy was examined with the aim of assessing the effect of road traffic crashes on Nigerian Economy (1981-2015). The secondary data gathered from CBN Bulletin, National Bureau of social statistics and FRSC Annual reports were analysed using Ordinary Least Square (OLS) statistical method of analysis. It was found that road traffic crashes do not exert significant impact on real GDP. However, Real GDP at lag 1 reinforces itself while road traffic crashes is negatively but insignificantly related to real GDP. In other words, RTC exerts a reducing effect on Real GDP though at an insignificant rate. The study also reveals that road traffic crashes neither exert any significant impact on labour force nor drives the labour force in Nigeria. The study further showed that RTC Granger causes government expenditure where as government expenditure does not Granger cause road traffic crashes in Nigeria which means that government spending help in reducing road traffic crashes by recruiting and paying more road safety officials, construction of new roads, building of more specialist hospitals and even payment of hospital bills and other benefits like death benefits, insurance benefits etc. as in the case of government employees. Government should pay more attention to the route causes of road traffic crashes (RTC) with aim of eliminating the menace of road traffic crashes which will consequently impact positively on economic growth in Nigeria. The study also recommended that government expenditure should be appropriately utilized in achieving its objectives, like construction of new roads and rehabilitation of the existing ones which will result to the reduction of RTC and in turn leads to economic development.*

**Keywords:** *RTC, Granger cause, road safety, Nigeria, FRSC*

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### **I. Introduction**

Balogun and Abarewja, (1992, p. 23) viewed Road traffic crashes (RTC) as a major cause of deaths in Nigerian Road traffic crashes (RTC) are major, yet neglected public problem in developing countries. Motorized road transport plays a central role in Nigeria. Obviously most of the goods needed for everyday life are transported by road and current generation has far greater opportunities for motorized travel in the course of work and leisure than their forefathers. But their advantages have been achieved at a large cost, the human and economic costs in terms of the numbers of road crashes, and of people killed and injured as a result of the road crashes.

WHO,(2004) stressed that an estimated 1.2 million people worldwide are killed as a result of road traffic injuries each year, occupying 30 to 70% of orthopaedic beds in developing countries hospitals. In 2002, road traffic crashes ranked as the 9th leading cause of burden of disease, accounting for 2.6% of all global fatality adjusted life years lost. Trends in motorization create an increase in road traffic injuries. Furthermore, by 2020, they could rank third in the order of burden of disease. Recognizing the burden of mortality and morbidity caused by road traffic crashes, WHO dedicated the year 2004 to road safety to create awareness on the issues. April 7, 2004 World Health Day focused on “road Safety”.

Ogwude, (2010) argued that important cause of road crashes usually identified by the federal Road Safety Corps and the Nigerian police relate to driver's errors, his state of arousal and level of experience. The other human factors arise from the errors other transport users such as pedestrians, passengers and wandering animals.

Tillman and Hobbs (2013) stressed that it is therefore obvious that transport user's behaviour is the fundamental cause of road crashes in Nigeria. Road user behaviour in Nigeria is not yet fully matured. While no actual crashes may occur at all conflict situation, cases of near crashes are frequent and leave the impression that road usage is too demanding and very stressful.

A new area of research termed: "Accidentology which looks at interaction between vehicle, road users and road infrastructure to identify solutions is now emerging. There is need to examine the effect of road traffic crashes on the economic performance of the country.

Over the past few decades, little effort has been made in Nigeria to assess the economic effect of road traffic crashes (RTC) owing to the lack of systematic crash data and or information. Road traffic crash is a sad and unfortunate event. It is sad because of huge human and material losses involved and unfortunate because it is preventable. Road traffic crashes affect mainly young men and women in their productive age. It also results in material losses such as destruction of infrastructure, including roads, bridges, electric poles and wires. The carnage on the highway affects most grievously the individuals involved. No one is spared the consequences of this enormous loss of human potential and suffering. As developing country vehicle use increases, road traffic injuries are also growing. By 2020, road traffic injuries are expected to be the third leading cause of death and disability among the productive members of the society.

Finally, examining the effect of road traffic crashes (RTC) with the use of data is important as a basis or tools to tackle road traffic crash (RTC) problems on economic performance of the country.

## **II. Review of related literature**

Iwata, (2010) examined the relationship between traffic crashes and economic growth in China. The study employed the semi parametric partial linear model in order to observe the flexibility of the relationship. The estimation results showed that the peak of traffic fatality and injury in China were \$1500 and \$4000, respectively.

Aderamo (2012) assessed the effect of road traffic injuries on productivity in Nigeria among 36 states. The methods of correlation and regression analysis were employed by the study. The regression results revealed road traffic crash injuries has a positive relationship with manpower in parastatals, employment in crop farming, registered teachers, police service and private farmers. On the other hand, the results showed that road traffic injuries has negative relationship with manpower in ministries and national unemployment in Nigeria.

Wagenaar (1984) investigated the effects of macroeconomic conditions on the incidence of motor vehicles crashes in USA. The study was designed to identify the relationship between changes in economic conditions, as reflected in the rate of unemployment, and motor vehicles crash involvement. The influence of vehicle miles traveled was also examined. ARIMA and dynamic regression time series modeling procedures were used to assess the direction, magnitude, and lag structure of the relationships. The study revealed a significant concurrent inverse relationship between the rate of unemployment and the frequency of crash involvement, and a significant lag 1 positive relationship between unemployment and crash involvement (see Van beeck *et al.*, 2000; Kopits and Copper 2005; Bishai *et al.* 2006; Anbarci *et al.*, 2009).

Apparao *et al.* (2013) opined that road traffic crashes have negative effect on economic growth in developing countries because of high cost with them, that is, road crashes lead to the loss of manpower and human resources and finally drain potential economic growth.

Enu (2014) empirically investigates the impact of traffic crashes on economic growth of Ghana from 1991-2011, using ordinary least square method to estimate expanded neo-classical production function that include traffic crashes, he confirmed that road traffic crashes indeed affect economic growth negatively. Aderamo (2012) assess the effect of road traffic injuries on productivity in Nigeria through multiple regression analysis. His assessment revealed that a relationship exists in the pattern of productivity in the labour sector in the country and road traffic crash injuries. The influence of socio-economic variables on traffic crashes has also been widely studied.

Soderlund and Zwi (1995) performed multiple regression analysis on number of vehicles per capita, road density total surface area, GDP per capita, health expenditure as percentage of GDP and population density. The authors found that GDP per capita and health expenditure as a percentage of GDP are associated with a declining rate of fatal injuries among road victims.

Greenawalt (2005) examined the effect of macro-economic conditions on traffic fatality rates across the United State from 1999-2003, the study revealed that the state level economic conditions significantly impact on traffic fatality rate. Specifically, a \$1000 dollar increase in per capita state GDP decreases state fatalities by 0.00524 per million vehicle mile travelled.

He *et al.* (2015) used multivariate fixed effects models for longitudinal data to examine gross regional product-road traffic fatalities and a set of relevant socio economic variables like territory, population, length of public motor roads in Russia from 2004- 2011 and found that road traffic fatalities decreases monotonically over time as gross regional product per capita increased in the 66 studied regions. Enu (2014) in his study equally found GDP per capita to be negatively related to road traffic crashes in Ghana.

Agyemang *et al* (2013) carried out a regression analysis of road traffic crashes and population growth in Ghana for the period spanning 1990-2012, the study revealed a strong positive relationship between road traffic crashes and population growth in Ghana.

Osayomi (2013) studied regional determinants of road traffic crashes in Nigeria from 2003-2007, incorporating economic development proxy by GDP per capita, population size, traffic density and road infrastructure in a stepwise linear regression and found that the length of highways is a significant contributor to vehicle crashes.

Hussin and Amiruddin (2013) employed analysis of variance (ANOVA) to investigate the influence of population density and number of vehicles registration on road traffic accident in Libya, their study revealed that population density and number of vehicles registration are significant in explaining the variation in number of total crashes in Libya. There have been a sizeable number of literatures on road traffic crashes in Nigeria, however, empirical investigations, particularly related to road traffic crashes and economic growth is extremely sparse. It is therefore important to note that this study uses national data rather than regional or state data to examine the impact of road traffic accidents on the growth of Nigeria economy.

Yusuf *et al.* (2015) carried out an assessment of road traffic crashes on Nigerian economy and found that there exists a significant and direct relationship between GDP and road traffic crashes in Nigeria over the period covered by the study at 1 percent level of significance. A percentage change in GDP brings about 1.76 percentage changes in road traffic crashes. This suggests that as economic activities increases the roads tends to very busy resulting to significant increases in the number of road users and increased traffic congestions which could increase the number of crashes on the roads. Therefore the degree of the responsive of road traffic crashes to the variations in economic activities is seen to be elastic in the long run.

Yusuf *et al.* (2015) opined that Government expenditure plays a significant role in the determination of road traffic crashes in Nigeria. However the degree of the responsiveness of road crashes to the changes in government expenditure appears to be inelastic. This implies that a proportionate change in government expenditure brings about a less proportionate change in road traffic crashes. This further suggests that when government spends more particularly on provision of economic services and social infrastructure such as good road networks road traffic crashes will be significantly reduced.

Adekunle (2013) investigates the impact of road traffic crashes on Nigeria economy and also examines socio economic variables that influence road traffic crashes in Nigeria for the period 1990 to 2013. The study revealed that road traffic crashes impact negatively on the growth of economy in developing countries.

### **III. Research Methodology**

#### **Research design**

Koutsoyannis (2003) defined research as an activity of investigation of a phenomenon in human experience which brings about new knowledge can be variation of different innovation in the case of production or invention.

Koutsoyannis (2003) the research used in this study is the quasi-experimental design also referred to as empirical survey. These were used because the study intends to investigate the strength of relationship between two or more economic factors.

However the researcher also made use of econometric technique and statistical table to analyze the effect of road traffic crashes (RTC) on the economic performance of Nigeria.

#### **Method of data collection**

This aspect of the study shows how data will be collected by the researcher during research work.

The secondary data will be collected from CBN statistical Bulletin, Road Traffic crash data will be obtained from federal Road Safety Corps annual report while Real Gross Domestic Product and Government Expenditure data will also be obtained from CBN statistical bulletin. Statistical data obtained will be analyzed critically in an econometric form, in order to know their significant effect on the economic development.

#### **Method of data analysis**

The data will be first subjected to stationarity test using augmented Dickey fuller unit root. Afterwards, the data will be subjected to Johanson co integration to determine the long run relationship among the variables.

The data will be subjected to ordinary least square (OLS) analysis and DW checked to know if it is spurious or not. If spurious (that is, if  $R^2 > DW$ ) by Rule of turmb, we then test the stationary levels using

Augmented Dickey fuller test. If found to be stationary after, we then test the long run relationship using Johanson cointegration. If cointegrated, we further estimate the short run analysis using error correction model.

### 3.5 SPECIFICATION OF THE MODELS

This model is specified in its functional and linear forms based on the variables in the model. The function form of the model in

$$RGDP=F(RTC, LAF, GvTEXP)$$

$$RGDR = b_0 + b_1 RTC + b_2 LF + b_3 GVTEXP + U_t$$

#### Vector Error Correction Model

Vector error correction model is an econometric technique that take care of the deviation of the long-run from the short-run behavior of the variables. This is done by incorporating one leg of the residual.

Hence, the vector Error Correction for the models are

$$\Delta \ln RGPP_4 = \beta_0 + \beta_1 \sum \ln RTCT_{t-i} + \beta_2 \sum \ln GEXP_{t-i} + \beta_3 \sum \ln LABF_{t-i} + \beta_4 \sum \ln INF_{t-i} + U \dots \dots \dots (1)$$

$$\Delta \ln RTCP_t = \beta_0 + \beta_1 \sum \ln RGDP_{t-i} + \beta_2 \sum \ln LABF_{t-i} + \beta_3 \sum \ln GEX_{t-i} + \beta_4 \sum \ln INF_{t-i} + U \dots \dots \dots (2)$$

$$\Delta \ln LABF = \beta_0 + \beta_1 \sum \ln RGDP_{t-i} + \beta_2 \sum \ln RTC_{t-i} + \beta_3 \sum \ln GEX_{t-i} + \beta_4 \sum \ln INF_{t-i} + U \dots \dots \dots (3)$$

$$\Delta \ln GEX = \beta_0 + \beta_1 \sum \ln RGDP_{t-i} + \beta_2 \sum \ln LABF_{t-i} + \beta_3 \sum \ln RTC_{t-i} + \beta_4 \sum \ln INF_{t-i} + U \dots \dots \dots (4)$$

#### Johansen's Cointegration Test

This technique represents an improvement in the sense that cointegrating relationship and error correction equation are jointly estimated. Moreover, no variable is arbitrarily set as a dependent variable. It also allows for testing restricted forms of the cointegrating vectors. Summarily, the first stage of co integration and error correction techniques is the test for unit root. Consequent upon this, the variables (RTC, RGDP, LABOUR FORCE AND GOVERNMENT EXPENDITURE) all will be subjected to a unit root test to determine their time series characteristic. Unit root test is basically required to ascertain the number of time a variable has to be differenced to arrive at stationary (Yoshida, 1990). Co integration deals with the methodology of modelling non-stationary time series variables and idea rest on the premise that even though two time series may not themselves be stationary, a linear combination of two non-stationary time series are said to be cointegrated (Iyoha and Ekanem,2002). Usually, for cointegration, the two time series have to be of the same "Order" that is they should be stationary after the same number of differencing.

### IV. Data Presentation

Time-series data on the following macroeconomic for the period 1981 to 2015 were used for the research work: Real Gross Domestic Product (RGDP), Road Traffic Crashes (RTC), Labour Force (LF) and Government Expenditure (Govt Exp.) were shown in table

#### 4.2 ANALYSIS OF DATA

**Table 42.1 Augmented Dickey-Fuller Unit Root Test**

Variables	Lag	ADF Test Statistic	Critical Values		Order of Integration	Remarks
			1%	5%		
RTC	8	-6.020389	-3.646342	-2.954021	1(1)	Stationary
RGDP	8	-4.666371	-3.646342	-2.954021	1(1)	Stationary
LF	8	-9.114400	-3.653730	-2.957110	1(2)	Stationary
GVTEXP	1	-8.705412	-3.661661	-2.960411	1(2)	Stationary

**Source:** Author's Computation

From the above table, the ADF statistic of all the series are more negative than their 1 and 5 percent critical values at first difference and are therefore said to be stationary. The researchers therefore tests for cointegration between the variables to determine the stationarity of the combined series. The result of the cointegration test for RGDP and RTC is presented in table 4.2.2 below.

**Table 2 Johansen Cointegration Test for RGDP and RTC**

Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized					
No. of CE (s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob	
None	0.208451	9.477452	15.49471	0.3231	
At most 1	0.060500	1.997024	3.841466	0.1576	

Trace test indicates no cointegration at the 0.05 level denotes rejection of the hypothesis at the 0.05 level MacKinnon-Haug-Michelis (1999) p-values

**Source:** Author's Computation

The result of the cointegration test indicates no cointegration equation at the 5 percent level. Based on this, the researcher employed the VAR method to estimate the model. The result of the VAR is given in table 4.2.3 as follows

**Table Vector Autoregression Estimate for RGDP and RTC**

Standard errors in ( ) &t-statistics in

	RGDP	RTC
RGDP(-1 )	1 .035676 (0.19846) [5.21849]	25.20696 (30.0217) [ 0.83963]
RGDP(-2)	0.072106 (0.22299) [ 0.32337]	-10.07020 (33.7315) [-0.29854]
RTC(-1 )	-0.000682 (0.00126) [-0.54026]	0.697800 (0.19095) [ 3.65430]
RTC(-2)	0.000494 (0.00124) [0.39984]	0.003927 (0.18691) [0.02101]
C	11.60608 (24.7190) [ 0.46952]	7786.953 (3739.26) [2.08248]
R-squared	0.966388	0.745854
Adj. R-squared	0.961587	0.709548
Sum sq. resids	28013.74	6.41 E+08
S.E. equation	31.63053	4784.787
F-statistic	201.2603	20.54327
Log likelihood	-158.1000	-323.7295

AkaikeAIC	9.884850	19.92300
Schwarz SC	10.11159	20.14974
Mean dependent	118.2918	31286.64
S.D. dependent	161.3856	8878.209
<hr/>		
Determinant resid covariance (dof adj.)		2.08E+10
Determinant res id covariance		1.50E+10
Log likelihood		-480.2679
Akaike information		29.71321
Schwarz criterion		30.16669

**Source:** Author's Computation

The results of the VAR show that road traffic crashes do not exert significant impact on real GDP. The researcher using Granger Causality test found that none Granger causes each other. The result of the Granger causality is shown in table 4.2.4 as follows

**Table 4.2.4 Pairwise Granger Causality Tests for RTC and RGDP**

Pairwise Granger Causality Tests

Date: 04/01/17 Time: 14:50

Sample: 1981 2015

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
RTC does not Granger Cause RGDP	33	0.14616	0.8647
RGDP does not Granger Cause RTC		2.66671	0.0871

**Source:** Author's Computation

To determine the effect of road traffic crashes on labour force, the researcher tested whether the two variables are cointegrated using Johansen cointegration test. The result of the cointegration test is shown in table 4.2.5 as follows:

**Table 5 Johansen Cointegration Test for LF and RTC**

Series: LF RTC

Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob**
None	0.244850	13.22466	15.49471	0.1068
At most 1 *	0.124037	4.237809	3.841466	0.0395

Trace test indicates no cointegration at the 0.05 level denotes rejection of the hypothesis at the 0.05 level MacKinnon-Haug-Michelis (1999) p-values

**Source:** Author's Computation

The results indicate no cointegration equation between the two variables at the 5 percent level of significant implying that long-run relationship does not exist among the variables. The VAR is employed further to assess the model and the result is shown in table 4.2.6 as follows.

**Table 6 Vector Autoregression Estimate for Labour Force and RTC**

Included observations: 33 after adjustments

Standard errors in () & t-statistics in []

	LF	RTC
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LF(-1)	1.141399 (0.18731) [6.09364]	5.484216 (3.59354) [1.52613]
LF(-2)	-0.115922 (0.19279) [0.60129]	-5.460828 (3.69863) [- 1.47644]
RTC(-1)	0.007630 (0.00924) [0.82575]	0.773236 (0.17727) [4.36190]
RTC(-2)	-0.002675 (0.00945) [0.28304]	0.025539 (0.18134) [0.14084]
C	-230.1119 (239.996) [-0.95881]	278.5321 (4604.33) [0.06049]
R-squared	0.999431 0.999350	0.750432 0.714780
Adj. R-squared	1710272. 247.1460	6.29E+08
Sum sq. resid	12293.32	4741.498 21.04849
S.E. equation	-225.9433 13.99656	-323.4296
F-statistic	14.22331	19.90482
Log likelihood	39121.45	20.13156
Akaike AIC	9690.962	31286.64 8878.209
Schwarz SC		
Mean dependent		
S.D. dependent		
Determinant resid covariance (dof adj)	Determinant resid	1.37E+12
covariance		9.85E+11
Log likelihood		-549.3135
Akaike information criterion		33.89779
Schwarz criterion		34.35128

**Source:** Author's Computation

The VAR model indicates that road traffic crashes has no significant impact on labour force. The researcher therefore employed ordinary regression arising from VAR lag order. The VAR lag order is shown to be 2 under LR, FPE, AIC, SC, HQ criteria presented in table 4.2.7 as follows.

**Table 7 VAR Lag Order Selection**

VAR Lag Order Selection Criteria

Endogenous variables:

LF RTC Exogenous variables: C

Date: 03/27/17

Time: 16:17

Sample: 1981 2015

Included observations: 32

Lag	Logl	LR	FPE	AIC	SC	HQ		
0	-670.8199		NA		6.28e+15	42.05125	42.14286	42.08161
1	-534.9709		246.2264*		1.669+12	33.81068*	34.08551	33.90178*
2	-533.4988		2.484098		1.95e+12	33.96868	34.42672	34.12051
3	-532.6258		1.364191		2.39e+12	34.16411	34.80537	34.37667

Indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Source: Author's Computation

Employing the lag length, the researcher estimated the RGDP- RTC series. The result is presented in table 4.2.8 as follows.

**Table 4.2.8 VAR Lag Order Regression**

Dependent Variable:	RGDP					
Method:	Least Squares					
Date:	03/30/17	Time:	19:17			
Sample (adjusted):	1982 2015					
Included observations:	34 after adjustments					
Variable	Coefficient	Std. Error	t-Statistic	Prob		
RGDP(-1)	1.099182	0.044410	24.75063	0.000759	0.0000	
RTC(-1)	-0.000313	-0.412849			0.6826	
C	15.04744	22.07743	0.681575		0.5006	
R-squared	0.966477	Mean dependent var			114.8538	
Adjusted R-squared	0.964315	S.D. dependent var			160.1809	
of regression Sum	30.25905	Akaike info criterion			9.741565	
squared resid Log	28383.92	- Schwarz criterion			9.876244	
likelihood	162.6066	Hannan-Quinn criter.			9.787495	
F-statistic	446.8756	Durbin-Watson stat			2.127223	
Prob (F-statistic)	0.000000					

Source: Author's Computation

The result of table 4.2.8 shows that Real GDP at lag 1 reinforces itself while the road traffic crashes is negatively but insignificantly related to real GDP. In other words, the RTC has reducing effect on the real GDP though at an insignificant rate. The Granger causality test shows that none of the variables Granger causes each other. Thus, road crashes neither exert any significant impact on labor force nor drives the labor force in Nigeria.

**Table 9 Pairwise Granger Causality Tests for RTC and LF**

Pairwise Granger Causality Tests				
Date:	04/01/17	Time:	16:11	
Sample:	1981 2015			
Lags:	2			
Null Hypothesis:	Obs	F-Statistic	Prob.	
RTC does not Granger Cause LF	33	0.56773	0.5732	0.0675
LF does not Granger Cause RTC		2.97243		

Source: Author's Computation

To determine the impact of road traffic crashes on Government expenditure or government expenditure on road traffic crashes, the researcher also found no cointegration equation between the two variables. The result of the cointegration test is shown in table 4.2.10 as follows.

**Table 4.2.10 Johansen Cointegration Test for GVTEXP and RTC**

Sample (adjusted):	1984 2015
Included observations:	32 after adjustments
Trend assumption:	Linear deterministic trend
Series:	GVTEXP RTC
Lags interval (in first differences):	1 to 2
Unrestricted Cointegration Rank Test (Trace)	



Hypothesized No. of CE (s)	Trace Eigen value	0.05 Statistic	0.05 Critical Value	Prob.
None	0.327756	13.37748	15.49471	0.1017
At most 1	0.020695	0.669184	3.841466	0.4133

Trace test indicates no co-integration at the 0.05 level denotes rejection of the hypothesis at the 0.05 level MacKinnon Haug Michelis (1999) p-values.

**Source:** Author's Computation

Since the variables are neither co-integrated of the same order nor co-integrated, the researcher used Granger causality for further analysis. The result of this analysis is shown in table 4.2.11

**Table 11 Pairwise Granger Causality Tests for RTC and GVTEXP**

Pairwise Granger Causality Tests				
Date:	04/01/17	Time:	16:33	
Sample:	1981 2015			
Lags:	2			
Null Hypothesis:	Obs	F-Statistic	Prob.	
RTC does not Granger Cause GVTEXP	33	6.51915	0.0047	
GVTEXP does not Granger Cause RTC		3.31336	0.0511	

**Source:** Author's Computation

The result in table 4.2.11 shows that road traffic crashes Granger causes Government expenditure where as Government expenditure does not Granger cause road traffic crashes.

### V. Discussion of Findings

The result of hypothesis one shows that Real GDP at lag 1 reinforces itself while road traffic crashes is negatively but insignificantly related to real GDP though at an insignificant rate. This is in line with Apparao (2013) who conducted a regression analysis of traffic Accident and population growth in Ghana and reveal that road traffic crashes have negative effects on economic growth in developing countries and Aderamo (2012) carried out a correlation and regression analysis on the Effect of Road Traffic Injuries on Productivity in Nigeria among 36 states. The result also show that RTC affect the level of productivity in Nigeria. This is true because RTC has negative relationship with manpower in ministries and national unemployment in Nigeria. RTC resulted to loss of lives, delay and damage to raw materials, industrial inputs and distribution of manufactured goods and if not checked over time will have a significant impact on real GDP.

Hypothesis two analysis reveal that Road traffic crashes do not exert any significant impact on labour force nor drives the labour force in Nigeria. Although Road Traffic Crashes leads to loss of lives and permanent injuries to the RTC victims. These occur mostly on the road users who are predominantly the youths, the active men and women that constitute the labour force. Road traffic crashes decimate the number of youths or men and women that made up the labour force through death, long term hospitalization and permanent disability. This result conforms to Aderamo (2012) who carried out a correlation and regression analysis on the Effect of Road Traffic injuries on productivity in Nigeria and concluded in his study that RTC does not have significant impact on Nigerian Labour force but if not checked over time will have a significant impact on Labour force.

Hypothesis three showed that Road traffic crashes Granger Cause Government expenditure where as government expenditure does not Granger cause road traffic crashes which means that government spending help in reducing road traffic crashes in Nigeria. This result is in line with Yusuf (2015) who conducted a research on Impact Assessment of Road Traffic Accident on Nigerian Economy (1990-2013) using econometric view 8.0 statistical role in the reduction of RTC in Nigeria. This result implies that government expenditure can come in the form of the government recruiting and paying for more road safety officials, construction of dualized lanes. Reshuffling of the standard organization of Nigeria (SON) that makes sure that imported cars are in good condition, building of more specialist hospitals and even payment of hospital bills and other benefits like death benefit, insurance benefit etc as the case of government employees.

### VI. Summary Of Findings

This study investigates the impact of Road Traffic Crashes (RTC) on Nigerian Economy for the period 1981 to 2015. The empirical result confirmed the view of Apparao et al (2013) that road traffic crashes has a reducing effect on the growth of economy in developing countries. The study also reveals that road traffic crashes neither exert any significant impact on labour force nor drives the labour force in Nigeria rather road

traffic crashes exerted a reducing effect on the country's national productivity and Nigerian labour force were due to the decline in the active men women within productive age who are willing and able to work but were incapacitated by road traffic crashes. The number of able bodied men and woman that are willing and able to work will decline.

It was also observed that government expenditure (GvtEX) plays a significant role in the reduction of RTC in Nigeria. The empirical result confirmed the view of Yusuf (2015) that increase in government expenditure brings about reduction in road traffic crashes. The increase in government expenditure can come in the form of government recruiting and payment of more road safety officials, construction of new roads and maintenance of the existing ones.

## **VII. Conclusion**

One of the negative externalities of heavy reliance on road transportation as a means of movement of people and goods is Road Traffic Crashes (RTC). Road Traffic Crashes (RTC) places a huge financial burden not only on families of victims but also on society at large.

The study reveal that road traffic crashes impact negatively on the growth of economy in developing countries. Road traffic crashes are predictable and preventable but good data are important to understand the ways in which road traffic intervention can be effective.

Road traffic injuries affect mainly young men and women in their active and productive period of life. Thus, leads to a decline in the Nigerian labour force and national productivity. Therefore, creating enormous economic hardship due to loss of breadwinners.

The policy implication that can be deduced from this work is that government should embark on expansion of road network and maintenance of the existing road network coupled with revitalization of alternative mode of transportation such as rail system and waterways will significantly reduce road traffic crashes (RTC) which will hitherto improve the growth of the economy.

It was also observed that government expenditure play a significant role in reducing road traffic crashes. An increase in government expenditure will lead to a reduction in road traffic crashes. That is, more money will be spent in recruiting more road safety officials, construction of new roads and maintenance of the existing ones, building of building of more specialist hospitals and payment of hospital bills and other benefits like death benefits, insurance benefits etc.as in the case of government employees. It is therefore timely to urge all agencies concerned to put efforts as well as sufficient manpower and other resources to effectively address the road traffic crash problems.

I believe that this research work is convincing enough to persuade policy makers to seriously resume implementation of road safety programmes for the benefits of the society as a whole. This study firmly believes that economists as well as lay men will realize how road traffic crash losses are for Nigerian economic development.

## **VIII. Recommendation**

From the above research work the following recommendations are necessary to reduce the effect of road traffic crashes in Nigeria.

1. The government of Nigeria should pay more attention to the maintenance of our highways and roads for safe use of the motorists. Adequate and efficient road network also serves as one of the channels for the distribution of goods and services, movement of people and dissemination of information. It help in the exchange of rural productivity as well as strengthening the socio-economic, cultural and political fabrics and processes of the country.
2. Government should engage in revitalization of the alternative mode of transportation such as Rail transportation system and Water transportation system which will significantly reduce the rate of road traffic crashes and also improve the growth of the Nigerian economy.
3. Driving and Traffic Safety Education should be introduced in primary, secondary and tertiary institutions. This life-centred education will constitute a single most powerful strategy for reducing death traps on the Nigerian highways.
4. Driving licenses should be issued to those who have passed through a series of Driving and Traffic Safety Tests (DTST).
5. Motor Vehicles should be thoroughly inspected for roadworthiness before registration. Inspection checklist should include the number of years the vehicle has been used, rear and side view mirror, windscreen, wipers, speedometer, brakes, brake lights, trafficators, reverse light and parking lights etc.
6. Road signs should be placed before approaching bad spots; bends and pedestrian crossing to enable drivers operate safely on the highways.

7. Federal Road maintenance Agency (FERMA), Federal Road Safety Corps (FRSC), Vehicle Inspection Officers (VIO's) and Traffic Warders should step up to their responsibilities.

Finally, Government should play active or proactive role in promoting road safety and allocate sufficient resources, particularly financial resources to help alleviate this severe health problem in our country.

### **Contribution to Knowledge**

This study has contributed to knowledge in several ways. The first is that through this research work, we have established that road traffic crashes exerted a reducing effect on the Nigerian Labour Force as active men and women within productive age continue to be involved in road traffic crash there is need for the Government to introduce safety education into primary, secondary school curriculum and also incorporate into GST Courses in Tertiary Institutions.

Secondly, the study revealed that government expenditure helps in road traffic crashes reduction in Nigeria. This implies that increase in government spending reduces road traffic crashes.

Therefore there is need for Government officials to supervise the implementation of approved projects to ensure the projects were implemented especially road projects to ensure they serve its purpose which will result to the reduction of RTC and in turn leads to economic development .

### **Limitations of the Study**

Some of the problems/ constraints encountered in the course of making this study a reality include the difficulty encountered in obtaining and arranging the data for the study. The problem of finance as most of the information used in the study necessitates visiting some government agencies, the internet and buying of textbooks. Also delay in getting the statistical package and in the analysis of the data using the computer package. And lastly, time and logistics (transport) created some problems along the course of putting this work together.

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