Quest Journals
Journal of Research in Humanities and Social Science
Volume 3 ~ Issue 12 (2015) pp:08-16
ISSN(Online) : 2321-9467
www.questjournals.org

Research Paper

Impact Assessment of Road Traffic Accidents on Nigerian Economy

YUSUFF, MULKAT AJIBOLA
Department of General Studies The Federal Polytechnic, P. M. B 50, Ilaro,Ogun State, Nigeria

Received 02 December, 2015; **A**ccepted 15 December, 2015 © The author(s) 2015. Published with open access at **www.questjournals.org**

ABSTRACT:- One of the negative externalities of heavy reliance on road transportation as a means of movement of people and goods is road traffic accident (RTA). Road traffic accidents place a huge financial burden not only on families of victims but also on society at large. This study aims to investigate the extent to which road traffic accidents affect economic growth in Nigeria and also to analyze the effects of relevant socio-economic variables on road traffic accident in Nigeria between 1990 and 2013.Two models; impact of traffic accident on economic growth and the extent of socio-economic determinants of road traffic accidents were analyzed using econometric view 8.0 (E-View 8.0) statistical package. The result showed that road traffic accident is inversely related to economic growth. . The study also showed a negative relationship between Gross Domestic Product Per Capita, total road network and road traffic accident. The study, therefore, concludes that reducing poverty and increase in number of road network in the country will go a long way to complement the effort of Federal Road Safety Corps (FRSC) in eliminating the menace of road traffic accident which will consequently impact positively on economic growth in Nigeria.

KEYWORDS:- Road Traffic Accident, Gross Domestic Product, Socio-Economic factors, GDP Per Capita, Total Road Network, Federal Road Safety Corps, E-View

I. INTRODUCTION

The World Health Organization (WHO) in itsglobal status report on road safety has continuously re-affirmed that approximately 1.24 million people lose their life each year on world's road and up to 50 million sustain injuries. Road traffic accident is predicted to rise to become the fifth leading cause of death in 2030, from ninth position in 2004 if adequate measures are not taken (WHO, 2011). Although road traffic accident isa global epidemic,the problem is more acute in the developing world. Developing countries especially the African region which account for only 2% of the world's vehicle fleet, bear 16% of the global death toll.

In Africa, Nigeria has the highest record of road traffic accident. Sumaila (2001) observed that road traffic accidents in Nigeria have claimed more lives than deaths resulting from all communicable diseases put together including the dreaded Acquire Immune Deficiency Syndrome (AIDS). The study of WHO in 2013 showed that more than one in four deaths inAfrica region occurs on Nigerian road and the country together with South Africa, Democratic Republicof Congo, Kenya, Ethiopia, Tanzania and Uganda accounted for 64 per cent of all road deaths in Africa. Despite various measures adopted in recent time to confront the problem, the morbidity and mortality from road accidents in Nigeria is still high with statistic of 33.7 death per 100 000 population annually (WHO, 2013). The Federal Road Safety Corps (FRSC) in 2013 also reported an increase of 2% in road traffic crashes and 6% increase in fatalities over what was recorded in 2012.

The economic consequence of road traffic accident apart from physical, social and emotional implications is enormous. Several epidemiological study of traffic accidents revealed that most victims of accidents are economically active adults between the ages of 30 and49 years and the resultant economic burden fall not only on families of victims by the loss of their breadwinners but also on nations economy through loss of productivity. According to Adekunle (2010) the direct cost of traffic accidents can best be understood in terms of the labour lost to the nation's economy with consequential reduction in productivity. Enu (2014) opined that when traffic accidents occur, quality of labour is affected adversely, human capital is lost, market size is reduced and potential economic growth is suffocated.The low- and medium-income countries are deprived of 2-3 percent of their gross domestic product because of road traffic accident while the loss to the global economy is estimated at $518billion annually.

The study of Labinjo et.al (2010) showed that of all subjects that are involved in road traffic accidents in Nigeria, 29.1 percent suffer disability and 13.5 percent are unable to return to work. The economic progress and development of Nigeria may be significantly retorted due to premature loss of qualified and potential contributing professionals and able-bodied men and women in the labour force. This study therefore aimed to empirically quantify the effect of road traffic accident on the growth of Nigerian economy with a view to bring to the forth the importance of giving priority attention to improvement in road safety in the country.

Limitation of the study

The trend analysis carried out in this study is limited to thirteen (13) years due to insufficient data on number of motor vehicle registration in Nigeria.

II. TRAFFIC ACCIDENT CONDITIONS IN NIGERIA

The nature of road traffic accident problems in Nigeria as at today can be best appreciated by looking at the trend of the country's population, number of vehicle registered, road infrastructure and number of road accidents.

Level and Trend of Automobiles Usage in Nigeria

A cursory look at table 1 shows the growth of population and the growth of automobiles in Nigeria during 2000-2012. It can be seen that there is a substantial increase in the number of automobiles compared to population increase during the period 2000-2012. Between 2000 and 2012, the population of Nigeria increased by 38.5% with the mean annual increase of 3.85%. On the other hand, the automobile fleets in the country increased by 941.47% with mean annual increase of 29.37%. The most remarkable increase occurred in 2006 when the number of registered vehicles rose by 5124000 from 2276000 in 2005 to 7400000 in 2006. (Table 1)

Table 1 Growth of Population and Vehicles in Nigeria: 2000-2012

Year	Population in '000	No. of Registered Vehicle	Annual Growth of Registered Vehicle	No. of Vehicle Per 1000 Population
2000	118.953	1300000	_	11
2001	122.228	1444000	11.08	12
2002	125.593	1734000	20.08	14
2003	129.050	2074000	19.61	16
2004	132.602	2178000	5.01	16
2005	136.253	2276000	4.50	17
2006	140.006	7400000	225.13	53
2007	143.854	7600000	2.70	53
2008	147.810	7800000	2.63	53
2009	151.874	9200000	17.95	61
2010	156.051	12366366	34.42	79
2011	160.342	13147865	6.32	82
2012	164.752	13539090	2.98	82
% change during 2000-2012	38.5	941.47		645.45
Average for the period 2000-2012	152.447	8205932	29.37	44.92

Source: Author's Computation

Motorization level as measured by the number of vehicle per 1000 population shows that on average there are 45 vehicles per 1000 population in Nigeria. Over all, motorization shows increasing trend and between 2000 and 2012, motorization increased by 645.45%.

Level and Trend of Road Network and Automobiles in Nigeria

Table 2 provides 13 year trends of total road network and automobiles for the period of 2000 and 2012. While the number of registered vehicles grew by 941.47% the road network witnessed a marginal increase of 3.5% in the period of study. Consequently, the number of vehicles per Km of road increased monotonically with average of 32 vehicles per Km of road.

Table 2 Level and Trend of Road Network and Automobiles in Nigeria: 2000-2012

Year	Registered Vehicles	Total Road Network	Vehicles Per KM of Road
2000	1300000	193200	6.73
2001	1440000	193200	7.45
2002	1734000	193200	8.96
2003	2074000	193200	10.73
2004	2178000	193200	11.27
2205	2276000	193200	11.78
2006	7400000	198000	37.37
,2007	7600000	198000	38.38
2008	7800000	198000	39.39
2009	9200000	198000	46.46
2010	12366366	198000	62.46
2011	13147865	198000	66.40
2012	13539090	200000	67.70
%changeduring2000-2012	941.47	3.52	905.94
Average for the Period 2000-2012	8205932	195938.45	31.99

Source: Author's Computation

Level and Trend of Road Traffic Accidents in Nigeria

The increase in level of motorization coupled with near collapse of rail system and high cost of air travels in Nigeria have put quite a lot of pressure on the country's road transport industry. This consequently has caused increased accident and fatality rate in the country. In absolute term there were 13262 traffic accidents in 2012 against 164.8 million population and 13539090 registered vehicles, indicating a rate of 8 accidents per 100000 population or 98 accidents per 100000 registered vehicles. (Table 3)

Table 3Level and Trend of Road Traffic Accidents in Nigeria: 2000-2012

Year	Number of RTA	Number of Death	RTA Per100000 Population	RTA Per 100000 Vehicles	Severity Index	Death Per 10 Crashes
2000	16606	8473	13.96	1277.39	0.51	5.10
2001	20530	9946	16.79	1421.75	0.48	4.84
2002	14544	7407	11.58	838.75	0.51	5.09
2003	14364	6452	11.13	692.57	0.45	4.49
2004	14274	5351	10.76	655.37	0.37	3.75
2005	9062	4519	6.65	398.15	0.50	4.99
2006	9114	4944	6.51	123.16	0.54	5.42
2007	8477	4673	5.89	111.54	0.55	5.51
2008	11341	6661	7.67	145.40	0.59	5.87
2009	10854	5693	7.15	117.98	0.52	5.25
2010	11385	6052	7.30	92.06	0.53	5.32
2011	13196	6054	8.23	100.37	0.46	4.59
2012	13262	6092	8.05	97.95	0.46	4.59
%changeduring 2000-2012	-20.14	-28.10	-42.34	-92.33	-9.80	-10
Average for the Period 2000-2012	12846.85	6332.08	9.36	467.11	0.49	4.99

Source: Author's Computation

As may be seen from table 2, even though the accidents and fatalities decline by 20.14% and 28.10% respectively between 2000 and 2012, the number of accidents and fatalitieshas continued to increase from 2009 to 2012. The average severity index for the period under study is still as high as 0.5 representing average of 5 death in 10 crashes.

III. LITERATURE REVIEW

Since road traffic accidents become a global health issue, a host of scholars and experts have continued to conduct a lot of in depth researches regarding traffic accidents. The researches that exist in literature on the relationship between road traffic fatalities and economic growth have come out with mixed results. While some studies discovered a non-linear or U-shape Kuznets curve relationship between traffic fatalities and economic growth, others found a strong linear relationship. In a single country analysis, a study undertaken by Garg and Hyder (2006) using data from India for the period of 1999-2001 found inverted U shape relationship between economic growth and road traffic fatalities. The findings ofRong et.al (2012) on analysis of long-term relationship between economic growth and mortality from traffic accident in China for the period 1990-2008 confirmed the U shape relationship. Ahmat (2011) found similar result with data from Malaysia for the period 1979-2007. The multi-countries studies of Kopits and Cropper (2005) based on panel data from 1963-1999 for 88 countries and Bishai et.al (2006) based on data from 41 countries for the period of 1992-1996 also identified a non-linear relationship between traffic fatalities and economic growth. However, some recent time-series studies have not shown the inverted U-shaped relationship. In their study of road traffic fatalities and the relationship with economic growth in Qatar, Jordan and United Arab Emirate using regression analysis, Bener et.al (2010) found a strong linear relationship between gross domestic product and fatality rate. The study Al-Reesi et.al (2013) using data from 1985-2009 in Oman also revealed that road traffic fatalities increased monotonically with economic growth.

In identification of accident black sports for national highways using GIS,Apparao et.al (2013) opined that road traffic accidents have negative effect on economic growth in developing countries because of high cost with them, that is, road accidents lead to the loss of manpower and human resources and finally drain potential economic growth. Enu (2014)empirically investigates the impact of traffic accident on economic growth of Ghana from 1991-2011, using ordinary least square method to estimate expanded neo-classical production function that include traffic accidents, he confirmedthat road traffic accidents 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 accident injuries.

The influence of socio-economic variables on traffic accidents 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 traveled. 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 toroad traffic accidents in Ghana.

Agyemang et.al (2013) carried out a regression analysis of road traffic accidents and population growth in Ghanafor the period spanning 1990-2012, the study revealed a strong positive relationship between road traffic accidents and population growth in Ghana.Osayomi (2013) studied regional determinants of road traffic accidents 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 accidents.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 totalaccidents in Libya.

There have been a sizeable number of literatures on road traffic accident in Nigeria, however, empirical investigations, particularly related to road traffic accidents 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.

IV. METHODOLOGY

Data and Data Source

Secondary data is used for this study. The data on Gross Domestic Product Per Capita (GDPPC), Population (POPL), Total Road Network (TRN) and Labour Force (LAB) were obtained from the World Bank Development Indicators (WDI), the data on Gross Domestic Product (GDP), Government Expenditure

(GTEXP) and Gross Fixed Capital Formation (GFCF) were collected from Central Bank of Nigeria Statistical Bulletin 2014, the data on Road Traffic Accident (RTA) from Federal Road Safety Corps (FRSC) 2013 Annual Report, while data on Number of Registered Vehicles from Nigerian Bureau of Statistics (NBS) of various issues.

Model Specifications
Adopting neoclassical production function, the models are formulated thus:

MODEL 1
Impact of Road Traffic Accidents on Economic Growth
$GDPPC = AL^{\alpha 1}K^{\alpha 2}RTA^{\alpha 3}$
Linearization of the equation gives
$In\ GDPPC = InA + \alpha_1 InL + \alpha_2 InK + \alpha_3 RTA + U$
$\alpha_1 > 0,\ \alpha_2 > 0,\ \alpha_3 < 0$
$\alpha_1, \alpha_2, \alpha_3$ are parameters to be estimated
U is the error term

MODEL 2
Socio-Economic Determinants of Road Traffic Accidents
The log linear equation of socio-economic determinants of road traffic accidents is specified thus:
$RTA = BPOPL^{\beta 1}TRN^{\beta 2}GDPPC^{\beta 3}GDP^{\beta 4}GTEXP^{\beta 5}$
Logarithm transformation of the equation gives:
$In\ RTA = InB + \beta_1 InPOPL + \beta_2 InTRN + \beta_3 InGDPPC + \beta_4 InGDP + \beta_5 InGTEXP + U$
$\beta_1 > 0,\ \beta_2 < 0,\ \beta_3 < 0,\ \beta_4 > 0,\ \beta_5 < 0$
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are estimation coefficient
U is the stochastic term

Estimation Techniques
In order to establish normality and stationarity of time series data used, some preliminary tests were conducted. Phillip Perrons unit root test was carried out for each variable both at level and at first difference. Conclusions about stationarity are made by comparing PP statistic and P-values. Co integration tests using Johansen and Jesulius (1990) co integration approach were also carried out to verify the existence of long run relationship between the dependent variable and explanatory variables. After the preliminary test, the parameters of the equations were estimated using Ordinary Least Square method.

V. EMPIRICAL RESULT AND DISCUSSIONS

The impact of Road Traffic Accidents on Economic Growth
Unit Root Result
The result from the unit root test in table 4 shows the null hypothesis of unit root can only be rejected for economic growth variables while it is being accepted for the other variables in the model at levels. The result of the first difference operation however indicates that the variables were all stationary at this level, hence were all integrated to order 1 process.

Table 4: Phillip Perrons (PP) Unit Root Test at Levels and first difference

Variable	PP Test @Levels	PP Critical values	Test @ First Difference	PP Critical values @ 1%	Remark
LGDP	-4.502906*	-2.998064	-3.476755**	-3.004861	Integrated to order 1
LLAB	-1.196277	-2.998064	-12.721693*	-3.004861	Integrated to order 1
LGFCF	-2.485361	-2.998064	-5.721693*	-3.004861	Integrated to order 1
LACC	-1.629570	-2.998064	-5.237809*	-3.004861	Integrated to order 1

, **, * Represents stationary trend at1%, 5% and 10% level of significance respectively*

Co integration Result
The co integration table 5 below shows at least one co integrated series for both the maximum Eigen value and trace statistics at 1 percent and 5 percent level of significance.

Table 5: Co integration Result

Hypothesized No. of CE(s)	Eigen Value	Trace Statistics	0.05 Critical Value	Prob.**	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.727831	56.28869	47.85613	0.0066	28.62928	27.58434	0.0366
At most 1	0.489226	27.65941	29.79707	0.0865	14.78020	21.13162	0.3046
At most 2	0.425644	12.87920	15.49471	0.1193	12.19911	14.26460	0.1034
At most 3	0.030440	0.680089	3.841466	0.4096	0.680089	3.841466	0.4096

The existence of co integration further indicates there is a long run relationship between labour force, gross fixed capital formation, road accidents and economic growth in Nigeria.

Regression Result

Table 6: Impact of Road Traffic Accidents on Economic Growth in Nigeria **Dependent Variable: LGDPPC**				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LLAB	2.101712	0.460058	4.568367	0.0002
LGFCF	0.105986	0.270710	0.391511	0.7000
LACC(-2)	-1.153302	0.294950	-3.910167	0.0010
C	9.344897	4.411541	2.118284	0.0483
R-squared	0.878035			
Adjusted R-squared	0.857707			
F-statistic	43.19442	Durbin-Watson stat		1.654055
Prob(F-statistic)	0.000000			

The analysis of table 6 shows evidence of no auto correlation associated with the model estimates as shown in the Durbin Watson statistics based on the rule of thumb. The R-squared result of 0.878 further indicates that 87.8 percent of the total variations in economic growth are explained by the changes in labor force; gross fixed capital formation and road accidents lag 2. The adjusted R-squared result shows that at 85.77 percent of this variation did merely result from the included exogenous variables in the model and are of good fit. The result of the F-statistic indicates the entire model is statistically significant and thus all the explanatory variables are significantly different from zero. Generally all the exogenous variables except capital formation suggest a significant relationship with economic growth at percent significance level. A close observation of the coefficient estimate for labour indicates a significant direct relationship between economic growth and labour force. A percentage change in labour force brings about 2.10 percentage changes in economic growth. This result conforms to a priori expectation indicating that as more labour are employed the higher the production of more goods and service through higher productivity of labour particularly in a labour intensive economy such as Nigeria. The estimated elasticity co efficient for labour reveals that the degree of the responsiveness of labor to economic growth is elastic. Although capital formation reveals a direct relationship with economic growth and thus conforms to economic expectation, it is found to be statistically insignificant at 5 percent level of significance. This further iterates the necessity of attracting more capital investment into the economy that will significant boost economic growth and improve the welfare of the citizenry. The long run coefficient of road accidents shows a significant inverse relationship between road accidents and economic growth at 1 percent level of significance. This implies that increases in road transport accidents significantly reduces that the level of economic activities in an economy through reduction of economically active population which consequently leads to significant reduction in output. A percentage change in road traffic accidents results to 1.15 percentage

changes in economic growth holding other factors at a constant. The above result further suggests a proportionate change in road traffic accidents leads to a more proportionate change in economic growth.

Socio-Economic Determinants of Road Traffic Accidents in Nigeria

Unit Root Result

The evidence from the unit root test in table 7 shows that all variables except road traffic accident variable and GDP per capita were stationary at their levels. This portrays the evidence that the null hypothesis of unit root cannot be rejected for all the variables at their levels. The study therefore preceded further to difference the variables at first differencing to achieve stationarity for the entire series. The unit root result therefore indicates that the series achieved a trend stationary process at order 1, thus were all integrated at first difference.

Table 7: Phillip Perrons (PP) Unit Root Test at Levels and first difference

Variable	PP Test @Levels	PP Critical values	Test @ First Difference	PP Critical values	Remark
LRTA	-1.629570	-2.998064	-5.237809*	-3.004861	Integrated to order 1
LPOPL	-5.046112*	-2.998064	-17.01817*	-3.004861	Integrated to order 1
LTRN	-8.062921*	-2.998064	-3.220483**	-3.004861	Integrated to order 1
LGDPPC	-0.081967	-2.998064	-4.245130*	-3.004861	Integrated to order 1
LGEXP	-6.013615*	-2.998064	-7.573992*	-3.004861	Integrated to order 1

, **, * Represents stationary trend at1%, 5% and 10% level of significance respectively*

Co integration Result

The existence of an integrated series implies the possibility of a long-run co-movement in the trend of the series over a considerable length of time. The result of the co integration in table 8 shows at least one co integrated series for both the maximum Eigen value and trace statistics at 1 percent level of significance which implies the existence of a long run relationship between populations, total road network, GDP per capita, economic growth, government expenditure and road traffic accident as the explained phenomenon.

Table 8: Co integration Result

Hypothesized No. of CE(s)	Eigen Value	Trace Statistics	0.05 Critical Value	Prob.**	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.976840	177.4126	95.75366	0.0000	82.83715	40.07757	0.0000
At most 1 *	0.882953	94.57545	69.81889	0.0002	47.19392	33.87687	0.0008
At most 2	0.673583	47.38153	47.85613	0.0554	24.63074	27.58434	0.1142
At most 3	0.476160	22.75079	29.79707	0.2585	14.22451	21.13162	0.3469
At most 4	0.230055	8.526278	15.49471	0.4110	5.751599	14.26460	0.6453
At most 5	0.118492	2.774679	3.841466	0.0958	2.774679	3.841466	0.0958

Regression Result

Table 9: Socio-Economic Determinants of Road accidents in Nigeria Dependent Variable: LRTA				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LPOPL(-2)	0.066711	0.040601	1.643098	0.1226
LTRN(-4)	-1.852932	0.679642	-2.726336	0.0164
LGDPPC	-1.736062	0.457124	-3.797790	0.0020
LGDP	1.763191	0.524662	3.360623	0.0047
LGTEXP(-1)	-0.529206	0.215310	-2.457882	0.0276
C	29.78859	7.418208	4.015604	0.0013
R-squared	0.747500	Durbin-Watson stat		2.174298
Adjusted R-squared	0.657321	F-statistic		8.289090
Prob(F-statistic)	0.000802			

The evidence from table 9 shows the socio-economic determinants of road accidents to include population, total road network, per capita GDP, GDP and government expenditure. Durbin Watson result revealed no presence of autocorrelation in the road traffic accident. Evidence from the R-squared result

indicates that variations in the included independent variables jointly and significantly explain 74.75 percent of the changes in road traffic accidents. This therefore indicates that the model is seen to be of good fit. The adjusted R-squared accounted for 65.73 percent of the explanatory power of the model. The model statistical significance and correctly explained the data at 1 percent level of significance as shown in the F-statistic (8.289; F-Prob = 0.0008).

Specifically a percentage change in population lag 2 brings about 0.067 percentage changes in road traffic accident, all things being equal. Further evidence from the estimated population parameter suggests that the degree of the responsiveness of road traffic accident to the variations in population is insignificantly inelastic. Hence changes population do significantly account for the variations in road traffic and may not considered a significant determinant of road accident over the period considered by this study.

An increase number of road networks will significantly help to reduce the number of vehicles plying a particular route and also help to reduce traffic congestions and frequency of accident occurrences. Evidence from the current study result in table 9 above shows that there exists a significant relationship between total road networks and road traffic accidents such that a percentage increase in total road network at lag 4 will significantly help to curb road traffic accidents by 1.85 percent holding other variables at constant. Thus the degree of the responsiveness of road traffic accidents to changes in total road networks is highly and statistically significant at one percent. This further suggests that total road networks are significant determinants of road accidents in Nigeria and exerts a cumulative effect on road traffic accidents.

GDP per capital is observed to constitute a significant determinant of road traffic accident as supported by the empirical evidence from this study. The result of the estimated coefficient of GDP per capita shows that a proportionate change in GDP per capita will lead to a more proportionate change in road traffic accident. Precisely a percent change in GDP per capita results to 1.74 percentage change in road traffic accident. A significant inverse relationship is established between GDP per capita and road traffic accidents which further conforms to theoretical expectations. This is so because as income increases people can afford vehicles routed with safety precaution thereby reducing the incidences of road traffic accidents. Hence GDP per capita plays a significant role in the determination of road traffic accidents in the Nigerian economy. Further analysis of the result shows that a proportionate change in GDP per capita leads to a more proportionate change in road traffic accidents.

There exists a significant and direct relationship between GDP and road traffic accidents 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 accidents. This suggests that as economic activities increases the roads tends to very busy resulting to significant increases in the number road users and increased traffic congestions which could increase the number of accidents on the roads. Therefore the degree of the responsive of road traffic accidents to the variations in economic activities is seen to be elastic in the long run and conforms to a priori expectations.

Government expenditure plays a significant role in the determination of road traffic accidents in Nigeria. At lag 1 a percentage change in government expenditure result to 0.53 percentage change in road traffic accidents and statistically acceptable at 5 percent significance level. However the degree of the responsiveness of road accident 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 accidents. This further suggests that when government spends more particularly on provision of economic services and social infrastructure such good road networks accidents will be significantly reduced. This study therefore provides empirical evidence that population, total road networks, GDP per capita, GDP and government expenditure are some of the socio-economic determinants of road traffic accidents in Nigerian economy within the scope of the present study.

VI. CONCLUSION

This study investigates the impact of road traffic accidents on Nigeria economy and also examines socio economic variables that influence road traffic accidents in Nigeria for the period 1990 to 2013. The empirical result confirmed the view of Apparo et.al (2013) that road traffic accidents impact negatively on the growth of economy in developing countries. The study further identifies population, GDP, GDP per capital, total road network and government expenditure as some of the socio-economic determinants of road traffic accidents in Nigeria. The policy implication that can be deduced from this studyis that reduction in poverty, expansion of road network and maintenance of existing road network coupled with revitalization of alternative mode of transportation such as rail system and waterways will significantly reduce accidents which will hitherto improve the growth of the economy.

REFERENCES

[1]. Adekunle, J.A. (2010). Road Traffic Accidents Deaths and Socio-Economic Development in Nigeria. Int. Rev. Bus. Soc. Sci. 1(5), 47-60.
[2]. Aderamo, A.J. (2012). Road Traffic Injuries and Productivity in Nigeria. Journal of Asian Scientific Research, 2(7), 334-344.
[3]. Agyemamg, B., Abledu, G.K. &Semevoh, R. (2013). Regression Analysis of Road Traffic Accidentsand Population Growth in Ghana. International Journal of Business and Social Research, 3(10), 41-47.
[4]. Ahmat, N.B., Nor Ghani, M.N., Ahmad, M.Z. & Abu Hassan, S.M.N. (2011). Relationship between Traffic Injuries and Economic development of Malaysia. JumalEkonomi Malaysia, 45(1), 81-87.
[5]. Al-Ressi, H., Ganguly, S.S., Al-Adawi, S., Laflamme, L., Hasselberg, M. & Al-Maniri, A (2013). Economic Growth, Motorization and Road Traffic Injuries in the Sultanate of Oman. Traffic Injury Prevention, 14(3), 322-328.
[6]. Apparo, G., Millikarjunareddy, P., & Raju, S.G. (2013). Identification of Accident Black Spots for National Highway Using GIS. International Journal of Scientific and Technology Research, 2(2), 154-157.
[7]. Bener, A., Hussain, S.J., Al-Malik, M.A., Shotar, M.M., Al-Said, M.F., &Jadaan, K.S. (2010).
[8]. Road Traffic Fatalities in Qatar, Jordan and the UAE: Estimate Using Regression Analysis and the Relationship with Economic Growth. Eastern Mediterranean Journal, 16(3), 318-323.
[9]. Bishai, D., Quresh, A., James, P. &Ghafar, A. (2006). National Road Casualties and Economic Development. Health Economics, 15(1), 65-81.
[10]. Central Bank of Nigeria (2014).Statistical Bulletin.
[11]. Enu, P. (2014). Road Traffic Accidents and Macroeconomic Conditions in Ghana. Social and Basic Sciences Research Review, 2(9), 374-393.
[12]. Federal Road Safety Corps (2013). Annual Report 2013.
[13]. Garg, N. &Hyder, A.A. (2006). Exploring the Relationship between Development and Road Traffic Injuries: ACase Study from India. European Journal of Public Health, 15(5), 487-491.
[14]. Greenawalt, K.R. (2005). The Effect of Macroeconomic Conditions on Traffic Fatality Rates Across the United States.(M.Sc Thesis).Wright State University.
[15]. He, H., Paichadze, N., Hyder, A.A., &Bishai, D. (2015).Economic Development and Traffic Fatalities in Russia: Analysis of Federal Regions 2004-2011. Injury Epidemiology, A Springer Open Journal.1-16.
[16]. Hussin, A.M.Y. &Amiruddin, I. (2013). An Analysis of Traffic Accidents in Libya, and Some Mitigation Strategies. Australian Journal of Basic and Applied Sciences, 7(4), 285-290.
[17]. Johansen, S. and K. Juselius, (1990), Maximum likelihood estimation and inference on cointegration - with application to the demand for money, Oxford Bulletin of Economics and Statistics, *52,* 169-210
[18]. Kopits, E. & Cropper, M. (2005).Traffic Fatalities and Economic Growth. Accident Analysis and Prevention, 37(1), 169-178.
[19]. Labinjo, M., Julliard, C., Kobusingye, O.C., &Hyder, A.A. (2010). Socio-economic Impact of Road Traffic Injuries in West Africa: Exploratory data from Nigeria. InjPrev, 16, 389-392.
[20]. Nigeria Bureau of Statistics (2005). The Nigerian Statistical Fact Sheets on Economic and Social Development.Pp 22.
[21]. Nigeria Bureau of Statistics (2006). The Nigerian Statistical Fact Sheets on Economic and Social Development.Pp 22.
[22]. Nigeria Bureau of Statistics (2007). The Nigerian Statistical Fact Sheets on Economic and Social Development.Pp 22.
[23]. Nigeria Bureau of Statistics (2012).Annual Report 2012.
[24]. Osayomi, T. (2013). Regional Determinants of Road Traffic Accidents in Nigeria: Identifying Risk Areas in Need of Intervention. African Geographical Review, DOI:10.1080/19376812.2012.750224.
[25]. Rong, H., Jun, Z., Chunping, Z., & Jian, T. (2012). Analysis of Long Term Relationship between Economic Growth and Mortality from Traffic Accident. Journal of Theoretical and Applied Information Technology, 46(1), 339-346.
[26]. Sodalund, N. &Zwi, A.B. (1995). Traffic-Related Mortality in Industrialized and Less Developed Countries. Bulletin of the World Health Organization, 73(2), 175-182.
[27]. Sumaila, A.F. (2013). Road Crashes Trend and Safety Management in Nigeria. Journal of Geography and Regional Planning, 6(3), 53-62
[28]. World Bank (2013).Nigeria: World Development Indicators. Retrieved October 10, 2015 from http://databank.worldbank.org/data/.
[29]. World Health Organization (2013). Global Status Report on Road Safety 2013. Retrieved October 10, 2015 from http://www.un.org/ar/roadsafety/pdf/roadsafetyreport.pdf