

Model Formulation for Predicting Future Highway Armed Robbery Incidents in Nigeria

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Abstract

Insecurity is a topical issue in Nigeria today. Loss of lives and valuables on Nigerian roads induced by crime and criminalities is on the increase and worrisome. The main aim of this paper is to propose a model for predicting future Highway Armed Robbery incidents through the analysis of the current trends of Highway Armed Robbery incidents (HARIs) in Nigeria from 2009-2014. Statistical analysis was done using Microsoft Excel and SPSS version 20. The analysis shows an increasing trend in HARIs in Nigeria. Furthermore, regression analysis was done and the eleven models available namely: Linear, Logarithmic, Inverse, Quadratic, Cubic, Compound, Power, S, Growth, Exponential, Logistic were estimated and the model with the highest R square value (R^2) was selected as the best Curvefit for the data and thus used for the model of prediction. The model that has been proposed can be used for predicting future HARIs that may guide policy makers and Security Personnel.

Keywords: Highway robbery, transportation, model formulation, Nigeria.

1. Introduction

Nigeria has had more than its fair share of armed violence (NWGAV and AOAV, 2012). The absence of adequate security on highways in the country has left the highways unsafe. Facts show that the rate of crime in public transportation system in Nigeria is on the increase. The country has lost a good number of her productive population to the incidences of crime on-board public transportation, which most times result to road crashes. Experience has it that some criminals board vehicles as passengers and along the way rob people of their valuables while some hijack vehicles and drive to nearby bushes to unleash terror on the helpless victims, and in some cases stones, tyre rims and woods are used to stop vehicles (Okunola, 2009; Omidiji and Ibitoye, 2010; Iweze, 2011).

Documentation of these incidents is however scanty and limited to some reports at different Police posts/offices along the highways. However, newspaper reports of victims are numerous. Whenever the number of deaths from armed robbery attacks is being mentioned, fifty percent (50%) of the incidents that occur on daily basis have no record because relatives at times will not have money to spend at the Police station. It is difficult to get any statistics on the extent of highway crime in Nigeria but the high rates of crime and violence keep the highways bloody and boiling. These attack usually occur at some dark spots such as the Lagos-Ore-Benin highway, Lagos-Ibadan highway, Lokoja-Okene highway, Abuja-Lokoja highway, Enugu-Port Harcourt highway, Abuja-Kaduna highway, Benin-Onitsha highway, Lagos-Seme Highway, Kaduna-Keffi highway, Asaba-Benin highway and a host of other highways. The Lagos-Shagamu-Ore-Benin highway has been tagged the devils highway and a nightmare by travellers.

The regular and similar patterns of these robbery occurrences had remained a cause of concern to many motorists especially as one could easily see police patrol vans and personnel very close to the scenes of such robberies. Despite public-private partnership, which propels key programmes and policies of government, insecurity and real threats to lives and property loom large on highways and cities. From Lagos to Benin, Lokoja to Abuja, Enugu to Port Harcourt to mention but a few, these tracks of problems are replicated in increasing magnitude. Yet the need to make the highways serene and comfortable for drivers and passengers cannot be overstretched. This is a huge task facing government and security agencies in Nigeria (Okunola, 2009; Ojinma et al, 2014).

This paper is focused on the proposal of a model for predicting future Highway Armed Robbery incidents through the analysis of the current trends of Highway Armed Robbery incidents (HARIs) in Nigeria from 2009-2014.

2. Methods

Since it is difficult to get any statistics on the extent of highway crime in Nigeria, the data used for this study were gathered mostly from published newspaper reports of the robbery occurrences and victims' stories, which were compiled and analysed with Microsoft Excel and SPSS version 20. Regression analysis was done and the eleven models available namely: Linear, Logarithmic, Inverse, Quadratic, Cubic, Compound, Power, S, Growth, Exponential, Logistic were estimated and the model with the highest R square (R^2) was selected as the best Curvefit for the data. The independent variable was "Number OF HARIs" while the Dependent variable is in "Years".

2.1. Results and Discussion

Figure 1 shows the increasing trend of HARIs in Nigeria, figure 2 shows the regression analysis done.

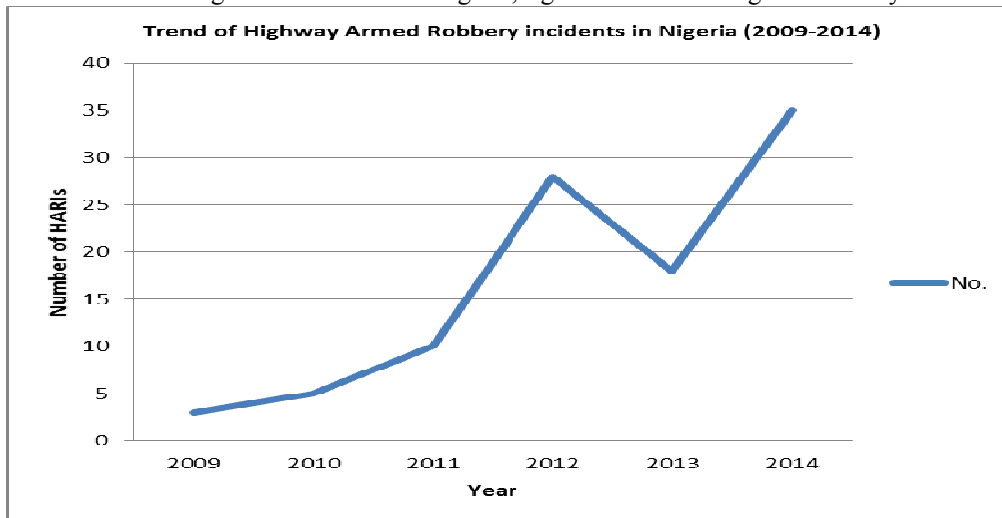


Figure 1: Trends of Highway Armed Robbery incidents in Nigeria (2009-2014)

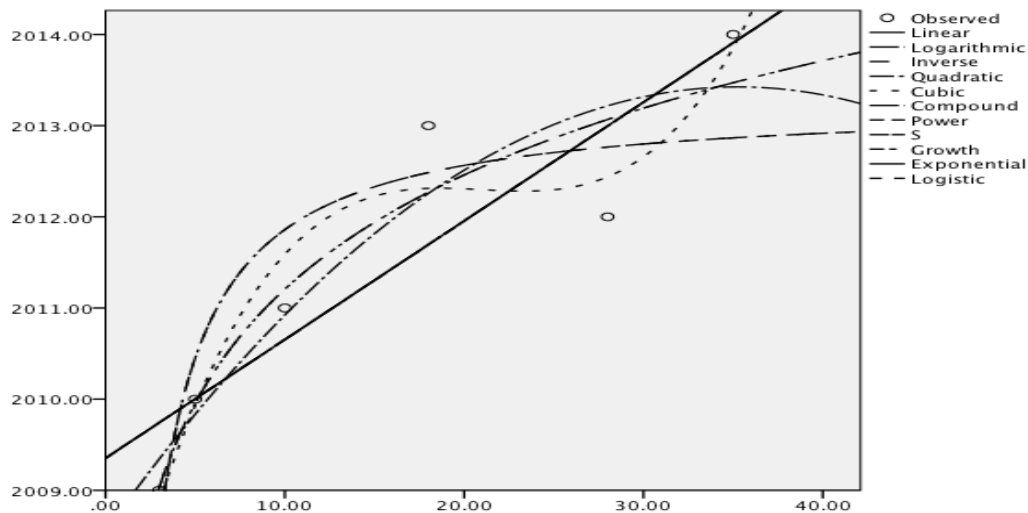


Figure 2: Curvefit (Regression Analysis)

Table 1: Model Summary and Parameter Estimates for Number of Highway Robbery incidents and Years of Incidents.

Equation	Model Summary					Parameter Estimates			
	R Square (R ²)	F	df1	df2	Sig. (p)	Constant	B ¹	B ²	B ³
Linear	.807	16.734	1	45	.000	2009.352	.130		
Logarithmic	.886	31.004	1	45	.000	2007.046	1.807		
Inverse	.814	17.464	1	45	.000	2013.268	-14.088		
Quadratic	.856	8.920	2	35	.000	2008.550	.276	-.004	
Cubic	.940	10.410	3	25	.000	2006.786	.808	-.039	.001
Compound	.807	16.730	1	45	.000	2009.353	1.000		
Power	.886	31.043	1	45	.000	2007.050	.001		
S	.814	17.495	1	45	.000	7.608	-.007		
Growth	.807	16.730	1	45	.000	7.606	6.471E-005		
Exponential	.807	16.730	1	45	.000	2009.353	6.471E-005		
Logistic	.807	16.730	1	45	.000	.000	1.000		

2.2. Formulation of the Model of Prediction

Table 1 shows the equations for the best Curvefit. It is observed that the equation that represents the best Curvefit is the cubic equation since it has the highest R Square value ($R^2 = .940$) with $p = .000$ and it is best fit for predicting the Number of Highway Armed Robbery Incidents. Therefore, the equation for predicting future Highway Armed Robbery Incidents may be expressed as:

$$Y = 2006.768 + .808B^1 - .039B^2 + .001B^3$$

Where:

Y = Years

B = Number of HARIs

3. Conclusion

There is limited documentation in Highway Armed Robbery Incidents (HARIs) in Nigeria. The rising trend of HARIs in Nigeria requires the attention of adequate security measures to be put in place. However the model developed for predicting future HARIs was a representative of the data collected and can thus be used adequately for prediction.

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