



## DETERMINANTS OF HIGHWAY CODE AWARENESS AMONG COMMERCIAL MOTORCYCLE RIDERS IN KWARA STATE NIGERIA

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### Abstract

The movement of people, goods and services is imperative in any society. This is because economic activities must go on for people to survive and to ensure the development of the society as well. Movement becomes easy if the roads are safe given the attitude of the road users towards road traffic regulations such as Highway Code awareness. This makes it significant to examine what determines Highway Code awareness in Nigeria. The objective of the study was to evaluate the determinants of Highway Code awareness among commercial motorcyclists in Kwara State. The study used primary data sourced through questionnaire randomly distributed to 1,178 commercial motorcyclists in Kwara State, Nigeria. Statistics show that 32.97 percent, 45.16 percent and 23.08 percent of the commercial cyclists were aware of Highway Codes in the State, Urban and rural areas respectively. The logistic regression results show that operation hours, mode of operation, education and earnings among others explain Highway Code awareness. The study concludes that there exists a low level compliance with Highway Code awareness among the commercial cyclists and earnings is a key determinant of Highway Code awareness. The traffic law enforcement agents need to sensitize and educate the road users on road traffic regulations in Nigeria given the low compliance levels with Highway Code awareness among the commercial cyclists observed in the study.

**Keywords:** Transport; Motorcycle; Highway Code; Okada; Traffic Safety; Kwara State, Nigeria

### Introduction

Transportation is the engine room of any economy because people, goods and services must be transported from one geographical region to the other for efficient economic activities. Besides, safety is a crucial issue in the developing countries (Shah et al. (2007). This is because road users' most especially informal transit service providers such as commercial motorcyclists in Nigeria often violate road traffic regulations. The World Health Organization opined that about 1.5million people die yearly due to road traffic accidents. Several countries the world over adopt different measures to contain road traffic violations and subsequent road crashes. Risa (1992) was of the opinion that there are legal regulations like speed limits, negligence and liability rules that are used in Bostwana to influence road users to behave in a

precautionary way. Constant et. al. (2008) contends that the enforcement of stricter road traffic regulations in France brought about significant changes in the attitude of road users in that country. Neeley & Richardson (2009) concluded that higher speed limits contribute to higher fatality rates. Friedman et al. (2009) observed that a 3.3 percent increase in road fatalities was attributable to raised speed limits in some parts of United States of America. The United Kingdom experienced reasonable drop in fatality rates than the USA by enforcing the use of speed camera networks (Elvik, 2010).

Driver attitudes and perceptions are the main factors influencing compliance with safety rules (Douglas and Swartz, 2009). Musilimu and Oluwole (2014) examined the characteristics of safety awareness of commercial cyclists in tree

major cities in western Nigeria. The study used both primary and secondary data. The primary data was collected through a structured questionnaire administered to 120 commercial motorcyclists across the study area. The study revealed that “care free attitudes” of most commercial cyclists towards their own safety as well as their passengers was responsible for the noncompliance with safety rules in the study area. The study concluded that the activities of the commercial cyclists should be regulated by the government.

A study on the relationship between road infrastructure and driver compliance with safety regulation was conducted by Derek and Abubakar (2014). The study tries to establish a mediating variable between road infrastructure and driver compliance. Primary data generated through a structured questionnaire was used in the study. The study used multiple regression analysis to analyze the data. It was found that road infrastructure and road safety regulation enforcement have a positive significant correlation with driver compliance to safety rules. Previous studies paid less attention to what actually determine compliance with safety regulations. The objective of this paper therefore, is to evaluate the determinants of Highway Code awareness among commercial cyclists. This paper is divided into four sections. Following the introductory part, section two contains the methodology; discussion of results is presented in section three; while conclusion and recommendation forms the fourth section.

## Methodology

The method of analysis used in this study in analyzing the issue of compliance with road safety regulations among informal transit service providers such as commercial motorcyclists is qualitative response regression models. This is based on some characteristics which are personal, operational and environmental in nature in the transport sub-sector. The commercial cyclist is either obeying or violating the rule i.e obeying = 1; 0, if otherwise (Arosanyin *et al.*, 2012, 2013; Arosanyin and Yakubu, 2014). The response variables analyzed in this study is Highway Code awareness.

The logistic regression model is stated as follows:

$$\text{Log}\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p \quad (1.0)$$

From Equation (1.0) we can obtain;

$$\pi = \frac{e^{\alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p}}{1 + e^{\alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p}} \quad (2.0)$$

Equation (2.0) can be rewritten as;

$$P(Y = 1 | x_1, x_2, \dots, x_p) = \frac{e^{\alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p}}{1 + e^{\alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p}} \quad (2.1)$$

Where Y = Highway Code awareness, and  $X_1, \dots, x_p$  is a vector of regressors that contain variables such as age operational hours; mode of operation, earnings, ownership type and educational attainment. This means that the nature of the response variables is not quantitative but qualitative (Maddala, 1983; Williams, 2008; Gujarati, 2009). The study used primary data generated through the use of Questionnaire randomly administered to 1,178 commercial cyclists representing 10 percent of 11,972 registered motorcyclists surveyed across the 16 LGAs along rural-urban divide of Kwara State, Nigeria. The operators were selected using random sampling technique. This sampling method was used to give equal chance to all the *Okada* riders in the target population to participate in the survey.

## Discussion of Results

The National Road Traffic Regulations (NRTR) of Nigeria stipulates that no one is qualified to drive either a motor vehicle or motorcycle until one attends an approved driving school. And that all the necessary Highway codes will be adequately taught in the driving school (NRTR, 2004; PP.B192).

### TABLE 1

Table 1 presents the full logistic regression on Highway Code awareness among commercial cyclists in Kwara State, Nigeria. The results indicate that the probability of Highway Code awareness among *Okada* operators increases as the number of operation hours increases. In terms of odds ratio, cyclists who operate above 8 hours daily which is equivalent to average daily operation hours in *Okada* business, have odds of

Highway Code awareness 0.1551 times higher than those who operate below 8 hours daily. That is, the odds of *Okada* riders who operate for longer hours daily who have Highway Code awareness are 15.51 percent higher than those who operate for few hours a day. This indicates that commercial cyclists who operate for longer hours have the opportunity to master the highway codes and it could go a long way in reducing road crashes. In the same vein, if commercial cyclists engage in full-time operation, the probability of Highway Code awareness increases. In this way, full-time cyclists have odds of Highway Code awareness 0.2839 times higher than those of part-time *Okada* riders. Therefore, the odds of full-time cyclists who are aware of Highway Codes are 28.39 percent higher than those of part-time operators in percentage terms.

The results indicate further that the probability of Highway Code awareness increases with increase in earnings, age of the commercial cyclists and motorcycle ownership. *Okada* riders who earn above industry average have odds of Highway Code awareness 0.001 times higher than those who earn below industry average. For age, cyclists who are a year older, have odds of Highway Code awareness 0.036 times higher than those who are younger. In addition, the odds of cyclists who are a year older and have Highway Code awareness are 3.6 percent greater than those of younger motorcyclists. Ownership type was significant and positive which implies that Highway Code awareness increases with motorcycle ownership. In terms of odds ratio, owner commercial cyclists have odds of Highway Code awareness 0.5047 times higher than those who rented motorcycles. This indicates the odds of owner operators who have Highway Code awareness are 50.47 percent higher than those of hiring-operators. The probability that a commercial cyclist will be aware of Highway Codes given that, he operates above 8 hours daily, operates on full-time basis, he is within the minimum age limit, own a motorcycle and earns above industry average is 0.7339.

#### TABLE 2

The full logistic regression results on Highway Code awareness among urban cyclists are presented in Table 2. The results show that the number of hours of operation was significant and positive. This implies that as the number of operation hours increases, the probability of

Highway Code awareness among urban motorcyclists tend to increase. In terms of odds ratio, urban cyclists who operate for longer hours have odds of Highway Code awareness 0.131 times greater than those who operate for few number of hours daily. In this way, the odds of *Okada* riders who operate for longer hours, and are aware of Highway Codes are 13.1 percent higher than those who operate for few hours. Ownership type was significant and positive which means that the probability of Highway Code awareness increases among owner operators. Looking at odds ratio analysis, owner operators who reside in the urban areas have odds of Highway Code awareness 2.421 times greater than hiring cyclists. In percentage terms, the odds of owner operators who are aware of Highway Codes are 242.1 percent higher than those of hiring operators. Earnings were also significant with a positive sign. This denotes that the probability of Highway Code awareness among urban motorcyclists increases as earnings increases. In terms of odds ratio, urban cyclists who earn above industry average have odds of Highway Code awareness 0.001 times greater than those with earnings below industry average. This implies that the probability of Highway Code awareness of an urban cyclist who earns above industry average is 0.1 percent higher than that of an urban cyclist who earns below the industry average.

The probability that an urban cyclist will have Highway Code awareness given that, he operates above 8 hours daily, owns a motorcycle and earns above industry average is 0.5059 while the probability that an urban cyclist will have Highway Code awareness given that, he operates below 8 hours daily, owns a motorcycle and earns above industry average is 0.500. Given the above, it could be deduced that operation hours; ownership type; and earnings are crucial in explaining Highway Code awareness among urban commercial motorcyclists.

#### TABLE 3

The full logistic regression results on Highway Code awareness among rural commercial cyclists are presented in Table 3. The results indicate that number of operation hours was significant and positive which means that the probability of Highway Code awareness among rural cyclists increases with longer hours of operation. Therefore in odds ratio terms, rural *Okada* riders who operate

above 8 hours have odds of Highway Code awareness 0.151 times higher than those who operate for few hours daily. For mode of operation, rural *Okada* riders who operate on full-time basis have odds of Highway Code awareness 0.2976 times higher than those who operate on part-time basis. In percentage terms, the odds of full-time *Okada* riders who have Highway Code awareness are 29.76 percent greater than those of part-time operators. Age was significant with a positive sign. This connotes that the probability of Highway Code awareness among rural cyclists increases as the age of the cyclists increases. In terms of odds ratio, rural cyclists who are a year older than the minimum have odds of Highway Code awareness 0.0398 times greater than those who are relatively younger. Another significant variable was Education with a positive sign. This connotes that the probability of Highway Code awareness among rural cyclists increases as the level of education attainment increases. It then follows that rural commercial cyclists with secondary education have odds of Highway Code awareness 0.098 times greater than those with no formal education. This denotes that the probability of Highway Code awareness of a rural commercial cyclist with secondary education is 9.8 percent higher than that of a rural commercial cyclist with no formal education.

Earnings were also significant with a positive sign. This indicates that the probability of Highway Code awareness among rural cyclists increases with increase in earnings. Using odds ratio, rural motorcyclists who earn above industry average have odds of Highway Code awareness 0.0003 times as high as those who earn below average. In percentage terms, the odds of rural *Okada* riders who earn above industry average and are aware of Highway Codes are 0.03 percent higher than those earn below industry average. The probability that a rural commercial cyclist will be aware of Highway Codes given that, he operates above 8 hours daily, operates on full-time basis, he is within the minimum age limit, has secondary education and earns above the industry average is 0.5123. In this connection, operation hours; mode of operation; age; educational attainment; and earnings are the important factors to consider in explaining Highway Code awareness in the rural areas.

## Conclusion and Recommendations

Transportation is the engine room of an economy. Commercial motorcyclists play a significant role in the movement of people, goods and services in Nigeria. Compliance with road safety regulations is paramount in order to curb road crashes and subsequent loss of lives and properties. The study concludes that factors such as operation hours; operation mode; earnings; age; and education are crucial in explaining Highway Code awareness among commercial cyclists in Kwara, Nigeria. Given the low level of compliance with Highway Code awareness among the informal transit service providers surveyed, the traffic law enforcement agents need to sensitize and educate the road users and enforce compliance with safety rules. The government should checkmate the situation where traffic law enforcement agents take the advantage of noncompliance with road safety regulations by road users to enrich themselves instead of enforcing compliance.

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## LIST OF TABLES

Table 1: Logistic Regression Results on Highway Code Awareness (aware = 1) in Kwara State, Nigeria

Variable	Analysis using coefficients				Odds ratio analysis		
	coefficient	Standard error	t. value	P value	Odds Ratio	Std. error.	P.value
Operation hours*	0.0286	0.0066	4.35	0.000	1.1551	0.0379	0.000
Operation mode*	-0.0694	0.0306	-2.26	0.024	0.7161	0.1098	0.029
Age*	0.0071	0.0017	4.20	0.000	1.0359	0.0087	0.000
Ownership**	0.0735	0.0438	1.68	0.093	1.5047	0.3590	0.087
Experience	-0.0067	0.0077	-0.88	0.378	0.9665	0.0365	0.368
Education	0.0060	0.0056	1.07	0.283	1.0339	0.0289	0.232
Earnings*	0.0001	0.0000	7.76	0.000	1.0006	0.0000	0.000
Union member	-0.0628	0.0492	-1.28	0.202	0.7248	0.1777	0.189
Cons.	-0.3247	0.0989	-3.28	0.001	<b>Summary statistics</b>		
No. of obs.	1151				LR chi2 (8)	114.89	
F	15.48				Pro>chi2	0.0000	
R <sup>2</sup>	0.0978				Psdo R <sup>2</sup>	0.0785	

Source: Author's computation. \* Significant at 5%; \*\*significant at 10%.

Table 2: Logistic Regression Results on Highway Code Awareness (aware = 1) among Urban Okada Riders

Variable	Analysis using coefficients				Odds ratio analysis		
	coefficient	Standard error	t. value	P value	Odds Ratio	Std. error.	P.value
Operation hours*	0.0275	0.0109	2.50	0.013	1.1312	0.0567	0.014
Operation mode	-0.0422	0.0528	-0.80	0.425	0.8172	0.1982.	0.405
Age	0.0006	0.0027	0.24	0.812	1.0029	0.0121	0.806
Ownership*	0.2304	0.0769	2.99	0.003	3.4207	1.4414	0.004
Experience	-0.0082	0.0121	-0.68	0.495	0.9619	0.0527	0.479
Education	-0.0072	0.0092	-0.78	0.436	0.9689	0.0397	0.442
Earnings*	0.0001	0.0000	6.28	0.000	1.0006	0.0000	0.000
Union member	-0.1006	0.1149	-0.88	0.382	0.6311	0.3309	0.380
Cons.	-0.0830	0.1883	-0.44	0.659	<b>Summary statistics</b>		
					LR chi2 (8)	67.90	
No. of obs.	518				Pro>chi2	0.0000	
F	8.92				Psd0 R <sup>2</sup>	0.952	
R <sup>2</sup>	0.1129						

Source: Author's Computation. \* Significant at 5%

Table 3: Logistic Regression Results on Highway Code Awareness (aware = 1) among Rural Commercial Cyclists.

Variable	Analysis using coefficients				Odds ratio analysis		
	coefficient	Standard error	t. value	P value	Odds Ratio	Std. error.	P.value
Operation hours*	0.0236	0.0081	2.91	0.004	1.1508	0.0545	0.003
Operation mode**	-0.0621	0.0370	-1.68	0.094	0.7024	0.1481	0.094
Age*	0.0065	0.0024	2.68	0.008	1.0398	0.0144	0.005
Ownership	-0.0097	0.0513	-0.19	0.849	0.9533	0.2801	0.871
Experience	-0.0034	0.0100	-0.33	0.738	0.9786	0.0557	0.704
Education*	0.0154	0.0069	2.22	0.027	1.0975	0.0452	0.024
Earnings*	0.00005	0.00003	1.74	0.082	1.0003	0.0002	0.066
Union member	-0.0621	0.0522	-1.19	0.235	0.6913	0.2016	
Cons.	-0.2032	0.1228	-1.65	0.098	<b>Summary statistics</b>		
					LR chi2 (8)	23.95	
No. of obs.	633				Pro>chi2	0.0023	
F	2.95				Psd0 R <sup>2</sup>	0.0348	
R <sup>2</sup>	0.0240						

Source: Author's computation. \* Significant at 5%; \*\* significant at 10%.