

# Impact of Commercial Motorcycle Transport in Raising Income: Evidence from Jigawa State, Nigeria

Gambo Babandi Gumel, Ibrahim Muhammad Adam & Itari Abdul-Razaq Rilwan  
Department of Economics and Development Studies  
Federal University, Dutse, Jigawa State, Nigeria  
Corresponding Author: Gambo Babandi Gumel

## ABSTRACT

The paper examines how commercial motorcycle business generates income for many of the unemployed people in Jigawa state and the North-Western region of Nigeria. The study employed primary data generated from a survey of 300 randomly selected motorcycle riders in three local government areas in Nigeria. Eviews9.0 & SPSS 20 software aided data analyses were used for descriptive analyses and in addition, an econometric model was specified and estimated using the OLS techniques. A majority of the operators (40.3%) generate average income of between N901 - N1, 200 and the multiple regression result reveal that years of experience, daily savings and daily fuel purchase are the major determinants of income generation model, although the model does not have a good fit given the very low value of  $R^2$  (0.31), but, overall, the model is highly statistically significant according to the F-test which is rejected at 1% level of significant. The model is very satisfactory as it passed two out of the three econometric tests conducted. The paper however, recommended government to formalize and regulate the activities of commercial motorcycle operators in order to strengthen the business. In this way, transport service delivery to the people will be enhanced; earnings of the Okada riders will equally be improved to maximize their welfare.

**Keywords:** Commercial Motorcycle, Transportation, Income

## INTRODUCTION

Motorcycle refers to two wheeled motor vehicle whose design varies greatly to suite a range of different purposes: long distance travel, navigating urban traffic, cruising, sport, racing and off-road riding. Compared with cars, motorcycles are especially high risk vehicles. Prior to 1980, motorcycles or motorbikes were primarily used for private purposes such as for individual

mobility and for domestic errands like fetching water and firewood, as well as for conveying farm produce from the farm or to the market (Ajayi, 2011; Nwaorgu, 2013). Furthermore, the use of motorcycles for transportation, and especially for commercial purposes, began about the mid-eighties as a result of the inadequacy in the scope, coverage and services rendered by the public transport system.

In different parts of Nigeria, the name "*Achaba; Going; Okada; Express, Inaga*, among many others" is a term used to describe motorcycle or bike used for commercial transportation. It is one of the chief modes of transport in Nigeria and, by far, the most common form of informal transport system in the country. This idea of using motorcycle/bike to carry passengers/commuters in Nigerian communities came up in the 1980s. This local motorbike commercial transport is also commonly used in some other West African Countries like Niger, Benin Republic, Burkina Faso, Liberia and Sierra Leone. As it is described by Odidi (2012) that: "Okada appeared in the late 1980s during an economic downturn in Nigeria. Jobless youths began to use motorcycles to earn money by transporting passengers on narrow or poorly maintained roads to far away cities and villages. This type of transportation quickly became popular and acceptance of it has increased steadily. *Achaba*; one of the informal sector economic activities, nowadays is the most popular primary modes of transportation in Nigeria and comprise a cheap and adaptable transportation system in the country by far. Even in remote villages they arrive at regular intervals, except in some crises prone areas where they are restricted and also, the FCT.

Commercial motorcycle has become a means of transportation regularly used by the young and old men, and a times few women in other regions apart from Jigawa. In order to provide themselves with means of support as an off-farm employment, many of the unemployed rural-urban migrants in Jigawa have no choice but to exploit the income and self or casual employment opportunities in the informal sector of the economy which commercial motorcycle taxi (popularly known as "*achaba* or *going* or *okada*") operations is counted as one of the readily available job opportunities. While many researchers have studied the employment generation potentials of the informal sector in Jigawa state, not much known attention is given to the income generation as well as poverty reduction implications of commercial motorcycle transport. It is against this backdrop the paper is intended.

Significantly, the paper focuses on the role of motorcycle taxis transport sub-sector in provision of job for income generation and its implications on poverty alleviation within the state and the country at large. This will provide an opportunity for the government to re-appraise the activities of the commercial motorcycle operators with the aim of making it economically and socially relevant to the aspiration of the people operating it and their customers as well. This paper can possibly spur government and private agencies to implement policies that will help the poor to get out of poverty. The findings of the study are expected to contribute to the debate on the contribution of the commercial motorcycle transport sub-sector in particular and the informal sector in general, towards poverty reduction, thereby expanding the frontier of knowledge in this area.

## LITERATURE REVIEW

A search of the relevant literature shows that motorcycles are relatively cheap to own and it provide convenient and relatively inexpensive alternative to automobiles. It is less regulated (in terms of licensing, enforcement and insurance) and can be faster than other modes on very congested roads, by swerving and bypassing other vehicles. In Jigawa and Nigeria, the use of motorcycle for private and public transportation cannot be overemphasized as numbers of motorcycles on Nigerian roads particularly in strategic urban centers and rural areas outshine that of motor vehicles.

As revealed in the works of authors like Olubomehin (2012) and Arosanyin, Olowosulu and Oyeyemi (2011), motorcycles are an additional means of commercial transportation, employment generation and earnings in Nigeria. This study revealed that the average daily income yields positive returns to the motorcyclists since their daily average consumption expenditure is less than the daily average income.

The commercial motorcycle transport popularly called *okada*; serves as a means of livelihood to many people in Nigeria, especially the uneducated population of Nigeria (largely concentrated in Northern Nigeria). A study by Taruwere (2012) evaluated the core determinants of earnings among 80 commercial motorcyclists across the rural-urban division in Kwara State, Nigeria. He used a modified Mincerian equation as tool for data analysis and his results shows that, the significant variables like age of *okada* riders; location; and license holding positively determine earnings while variables such as age;

and average fare charged per trip; negatively determine earnings. The findings of his study further indicate that *okada* riders earn a minimum of N500 and maximum of N2,800 per day. In this connection, education does not in any way determine earnings of commercial motorcyclists.

Most studies such as (Ogunsanya and Galtima, 1993; Adesanya, 1996; Adeyemo, 1998; Ojekunle; 1998; and Sodipe & Ogunrinola, 2011), do not thoroughly examine the core determinants of earnings among commercial motorcycle operators. Furthermore, Arosanyin (2010), attempted to bridge this gap by examining the determinants of earnings among commercial motorcyclist in Ilorin using an adapted Mincerian equation. Results from the study reveal that those variables such as patronage index; mode of operation; experience; ownership status and number plates were significant determinants of earnings in this informal transport mode. This study suffers from limited data base because it is urban focused.

The existing transport services (buses, cars and taxis) are unable to satisfy the prevailing demand of commuters in the great cities of Cameroon, especially in the early hours of the morning by half past 6 and also in the evenings between 4pm and 7pm, workers and students invade the streets and solicit the available means of transport for their movements between the different neighborhoods. This increases the chances of the motorcyclists to increase the number of hours they work in order to earn more income (Kaffo, Kamdem, Tatsabong, and Diebo 2008).

However, in most developed economies with sustained transport policies, motorcyclists like all other would be motorists and are expected to be formally trained at the end of which they are given valid papers confirming their competency to operate on various categories of roads. The reverse is the case in developing countries (Nigeria inclusive) where authorities in charge of vehicular operators do little or nothing to monitor motorcyclists who in most cases do not carry valid papers on them. For instance, in a study by Adetunji and Aloba (2014), indicated that 66.2% of the motorcycle operators spent less than two weeks on learning how to operate on the highways. Another 23.8% spent between 2 and 4 weeks, while only 9.5% of commercial motorcyclists spent more than 4weeks on how to effectively operate a motorcycle. The study further revealed that majority of the motorcyclists interviewed (67.2%) claimed to have been operating for over three years, as low as (32.8%) of the operators

have less than three year experience as commercial motorcyclists on urban roads.

The growth in the use of commercial motorcycles has also dispelled one of the commonly held illusions (Olvera, Plat and Pochet, 2007); fare controls in the public bus market are often justified to support affordability for a vast majority of low income population; however, commercial motorcycles are more expensive than the lowest bus fares, but are increasingly being patronized by the poor due to the inadequacy of bus services. In numerous cultures, motorbikes are the primary means of motorized transport.

It would appear that socio-economic considerations form the major driving force for commercial motorcycles in Nigeria include the low initial purchase cost, low operating cost which is generally related to the superior fuel economy or efficiency of motorbikes in relation to cars, their relatively low maintenance cost and perhaps the most important in Nigeria's context, is the employment opportunities it offers to our unemployed youths.

Despite the availability of motorcycles, the motorcyclists are faced continually with increases in the prices and shortages of fuel coupled with high cost of motorcycle spare parts. In Douala for example, an average sum of 3,000FCFA constitutes the daily revenue. Fuel expenditure stands at an average of 1500FCFA and feeding on a daily bases ranges between 500 and 1000FCFA. Thus the motorbike taxi operator has to work hard in order to make ends meet. Daily revenue oscillates between 7,000 and 9,000 FCFA (Olvera *et al*, 2007). All inherent expenses in the exercise of the activity are levied on the rider. In some cases, the «*work to pay*» system is applied. In this case, at the end of a certain period, the "loan-rider" owns the motorbike after haven paid a certain amount of money agreed upon at the beginning of the contract. When everything goes on well, the business becomes lucrative for its owner gets back his initial investment in less than a year and the revenue accrued is double. The average life span of a motorbike taxi is about four years.

Perhaps by far the most important consideration for people, especially the youths, to get involved in commercial motorcycle operator is the employment opportunities it provides. It has been argued that the recent upsurge in the unemployment rate among youths coupled with the poor economic situation in Nigeria has greatly influenced the rise in the use of motorcycles as means of commercial transportation (Abiodun, 2013). Christopher, Usman and Eke (2013) also notes that the number of commercial

motorcycle operator has created business opportunities for millions of Nigerians, especially the youths, the retired and the retrenched persons, as well as the educated and even the uneducated in the society. The jobs created by the commercial motorcycle initially got a good proportion of the youths quite busy and thus removed their minds from vices that are generally associated with their age brackets. That the same tool of employment (motorcycle operator) was being increasingly diverted for criminal tendencies became a serious puzzle. Unfortunately, the activities of the few who had taken to these vices became weighty enough to mar the positive contributions of the generality of the commercial motorcycle operators.

## **METHODOLOGY**

### **Population and Sampling Procedure**

This study was based on the study of the entire commercial motorcycle operators in Jigawa state, Nigeria. Jigawa state is one of the 36 states in Nigeria, located in the north-western part of the country. The state has 27 Local Government Areas, with three senatorial districts, namely. The study strategically selected three LGAs where concentration of commercial motorcycle operators is relatively higher, one from each of the three senatorial districts in Jigawa state. The three sampled LGAs for the survey are, Dutse LGA in Jigawa Central, Kazaure LGA in North-West and Hadejia LGA in North-East. The study adopted simple random sampling technique by way of administering a total of three hundreds (300) structured questionnaires designed to gather vital information from the commercial motorcycle operators.

### **Income Generation Model Specification**

Income analysis was conducted in order to determine the factors influencing the daily income distribution of commercial motorcycle riders' in the selected area of the study. The income analysis was based on the respondents daily income (INCC) as the dependent variable, while the number of hours worked per day (NHW<sub>D</sub>), years of experience (EXP<sub>C</sub>), ownership status (OWS), daily savings (SVG<sub>C</sub>) daily fuel purchase (FPD), and number of commercial motorcycles (NCM) stands as the explanatory variables. In general, following Becker (1975) and Mincer (1974), the study specifies the following econometric model:

$$INC_C = \alpha_0 + \alpha_1 NHW_D + \alpha_2 EXP_C + \alpha_3 OWS + \alpha_4 SVG_C + \alpha_5 FPD + \alpha_6 NCM + \mu \quad (1)$$

Equation (1) above is the econometric model for the income generation with  $\mu$  as the random term which is included in the model to take into account the influence of other omitted variables as well as any error of measurements. The  $\mu$  is assumed to be normally and identically distributed around zero mean and constant variance ( $\mu \sim N(0, 1)$ ). The a priori expectation of the model is that:  $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_6 > 0$  while  $\alpha_5 < 0$ . Note, the subscript c and d in the model stands for continuous, and discrete data, respectively.

## RESULTS

### Daily Income of the Motorcyclists

The result in table 4.1 shows that 5.3% of the operators in the study area generate between N301 - N600, 14.7% of the operators generate between N601 - N900, a majority of the operators (40.3%) generate between N901 - N1,200 and 39.7% of the operators generate average daily income above N1,200. The average daily income was used in order to make it easier for the operators to be able to recollect the amount they generate.

**Table 4.1: Daily Income of the Motorcyclists**

Category	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 301 - 600 Naira	16	5.3	5.3	5.3
601 - 900 Naira	44	14.7	14.7	20.0
901 - 1200 Naira	121	40.3	40.3	60.3
Above 1200 Naira	119	39.7	39.7	100.0
Total	300	100.0	100.0	

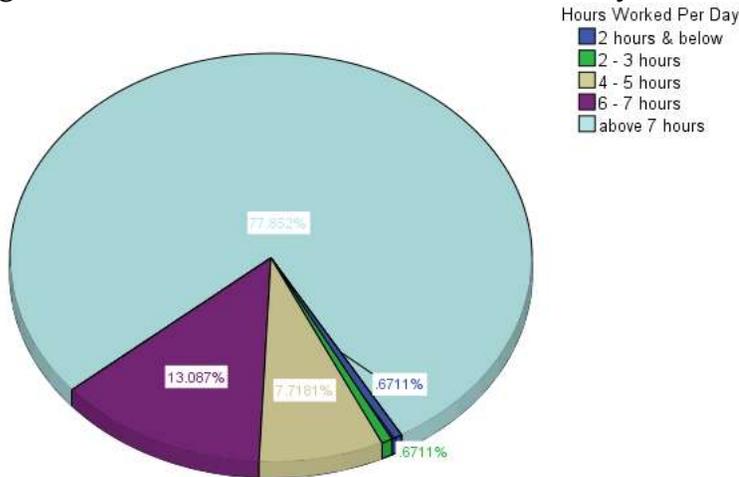
Source: Computation from SPSS 20

### Number of Hours Worked Per Day

From the figure 4.1 below, majority of the motorcycle operators, i.e. 77.9% operated for more than 7 hours a day this is followed by those who operated between 6 – 7 hours which constitutes 13.1% and then followed by 4 – 5 hours with 7.7%, below three hours has a very small contribution to the total

number of the respondents with a combined percentage of 1.34%. This means that most of the operators work extra miles in order to gain more income.

**Figure 4.1: Number of Hours Worked Per Day**



Source: Field Survey, 2016

**Number of Years Operating a Commercial Motorcycle**

From table 4.2 below, the study sought to establish the number of years, the commercial motorcyclist have been operating. From the table, those in the categories of below 1 year are only 20 respondents (i.e.6.7%), followed by 2 – 3 years with 42 respondents (i.e.14%), 4 – 5 years had 77 respondents with 25.7%, 6 – 7 years category recorded 35 respondents (i.e.11.7%) and lastly those who have spent above 7 years are 126 respondents with 42%. It is however not surprising that the most dominant years of operating commercial motorcycle is that of above 7 years followed closely by 4 – 5 years category and this is mainly due to unemployment.

**Table 4.2: Number of Years Operating a Commercial Motorcycle**

Category	Frequency	Percent
1 year & Below	20	6.7
2 – 3	42	14.0
4 – 5	77	25.7
6 – 7	35	11.7
Above 7	126	42.0

**Table 4.2: Number of Years Operating a Commercial Motorcycle**

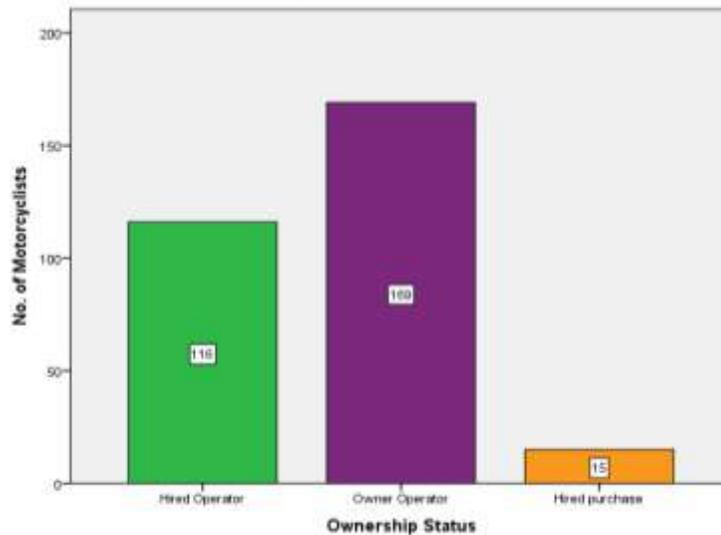
Category	Frequency	Percent
1 year & Below	20	6.7
2 – 3	42	14.0
4 – 5	77	25.7
6 – 7	35	11.7
Above 7	126	42.0
<b>Total</b>	<b>300</b>	<b>100.0</b>

Source: Computation from SPSS 20

### Ownership Status of the Motorcycle

According to the below bar chart, 169 respondents are owner operator of the commercial motorcycle, 116 respondents are hired operator while only 15 respondents are hired purchased operator. This implies that the majority of the commercial motorcycle operators owned their motorcycle which means that they are partially employed and therefore earned all the daily income as compared to the higher operator or higher purchased who have to remit some amount to the owner of the motorcycle.

**Figure 4.2: Ownership Status**



Source: Field Survey, 2016

### Daily Savings

Out of the 300 sampled surveys, only 220 riders save after their daily work. Majority of them have save below N1,000 with 88 (40%) followed by N1,001 – N2,000 with 55 (25%). Others include N2,001 – N3,000 with 16 (7.3%), between N3,001 – N4,000 with 41 (18.6%) while above N4,000 records only 20 (9.1%). With these percentages, therefore, it revealed that most of the *Okada* riders do save part of their earnings, mostly to start up other businesses of their choice.

**Table 4.3: Daily Savings of the Commercial Motorcyclists**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1000 Naira & Below	88	19.6	40.0	40.0
1001 - 2000 Naira	55	12.2	25.0	65.0
2001 - 3000 Naira	16	3.6	7.3	72.3
3001 - 4000 Naira	41	9.1	18.6	90.9
Above 4000 Naira	20	4.4	9.1	100.0
Total	220	48.9	100.0	
Missing System	230	51.1		
Total	450	100.0		

Source: Computation from SPSS 20

### Descriptive Statistics of Total Operating Cost of the Motorcyclists

The study tried to find out the daily operating cost of the commercial motorcyclist by merging the daily cost of fuel purchased and daily maintenance cost (which was derived from the monthly operating cost). Table 4.4 below shows that the maximum daily operating cost of the motorcyclist is N1,067 while the minimum daily operating cost is N107 with a mean amount of N495.28. This implied that the average daily operating cost of the motorcyclists is fair enough when compared with the daily average income of the respondents.

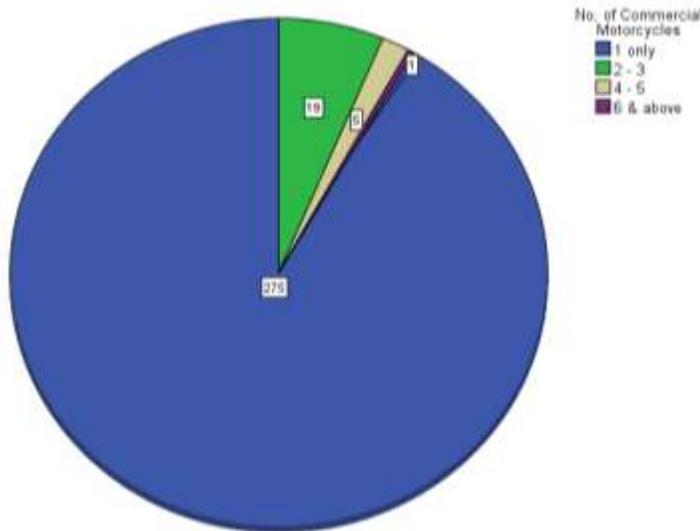
Category	N	Minimum	Maximum	Mean	Std. Deviation
Fuel purchased per day	300	100	800	415.98	137.583
Daily maintenance cost	300	7	267	79.30	43.781
<b>Total Operating Cost</b>		<b>107</b>	<b>1067</b>	<b>495.28</b>	<b>181.364</b>

**Table 4.4: Descriptive Statistics of Operating Cost of Commercial Motorcycle**  
**Source: Computation from SPSS 20**

### Number of Commercial Motorcycle(s)

Almost all the commercial motorcyclist operators i.e. 275 managed only 1 motorcycle, 19 of them managed between 2 and 3 while those who manage or have 4-5 motorcycle are 5, only 1 respondent have above 6 motorcycles. This is shown clearly on the pie chart below.

**Figure 4.3: Number of Commercial Motorcycle(s)**



Source: Field Survey, 2016

### Multiple Regression of Income Generation Model

Table 4.5 below shows the estimated results of the income generation model. From the table, it can be observed that, daily income of the respondents ( $INC_c$ ) has positive relationships with number of hours worked per day ( $NHW_D$ ), years of experience of the respondent ( $EXP_c$ ), ownership status of the respondent ( $OWS$ ), daily savings of the respondent ( $SVG_c$ ), daily fuel purchase of the respondent ( $FPD$ ), and number of commercial motorcycles of the respondent ( $NCM$ ). This means that the model is theoretically meaningful,

because all the parameters are based on the theoretical expectation with the exception of only FPD which is expected to have a negative relationship with  $INC_C$ ; because, an increase in the amount of fuel purchased per day will lead to a decrease in income earned by the motorcyclists, all things being equal. However, the coefficient of FPD is highly statistically significant at 1% level. And also  $EXP_C$  and  $SVG_D$  are found to be statistically significant at 5% and 1 %, respectively. The income model is fully supported by empirical findings of other similar studies conducted including World Bank (2002) report which revealed that, ‘in the last fifteen years the numbers of motorcycles per capita in many Developing Asian nations has doubled’.

**Table 4.5: Regression Results of Income Generation Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NHW <sub>D</sub>	3.747483	44.04644	0.085080	0.9323
EXP <sub>C</sub>	5.734075**	2.766656	2.072566	0.0394
OWS	26.33723	42.11143	0.625418	0.5324
SVG <sub>C</sub>	0.629134*	0.131004	4.802416	0.0000
FPD	1.247891*	0.175232	7.121346	0.0000
NCM	6.225254	54.99755	0.113191	0.9100
C	451.6188***	250.3720	1.803792	0.0727
<b>Statistical Tests</b>				
R <sup>2</sup>	0.314956			
Adj R <sup>2</sup>	0.295195			
F-statistic	15.93836			
<b>Diagnostic Tests</b>				
Autocorrelation Test (DW stat)	1.570938			
Hetroskedasticity Test (BPG)	0.376925			
Normality Test (JB-Stat)	15.99754*			

**Source; Computation from E-views 9.0**

Conversely, the model does not have a good fit given the very low value of  $R^2$  (0.31) which means only 31% of total variation in  $INC_C$  is accounted by the explanatory variables. But, overall, the model is highly statistically significant according to the F-test which is rejected at 1% level of significant. Econometrically speaking, the model is very satisfactory as it passed two out of the three econometric tests conducted. Specifically, the model is free from autocorrelation and hetroskedasticity problems, according to Durbin Watson

statistics and Breusch- Pagan Godfrey test, respectively. The only important econometric test that the model failed to pass is that of the normality test where the null hypothesis was rejected based on the Jacque Bera statistics at 1% significant level.

### Research Findings

The findings of the study reveal the impact assessment of commercial motorcycle transport on income generation in Jigawa state, Nigeria. The study employed primary sources of data where 300 structured questionnaires were administered across three local government areas within the state. The raw data were analyzed using descriptive statistics, and multiple regression analysis. The multiple regression result reveal that years of experience, daily savings and daily fuel purchase are the major determinants of income generation model. The findings of this research are summarised as follows;

- (i) Majority of the operators (i.e. 92.7%) in Jigawa state are ordinary motorcycle (Okada) riders while 7.3% are tricycle operators.
- (ii) About 5% of the operators in the study area generate an average daily income of between N301 - N600, 14.7% of the operators generate between N601 - N900, a majority of the operators (40.3%) generate between N901 - N1,200 and 39.7% of the operators generate above N1,200. This means that, a commercial motorcyclists earn a minimum of **N300** and a maximum of **N1,200** daily or a minimum of **N9,000** and maximum of **N36,000** monthly.
- (iii) Majority of respondents (i.e. 56.3%) are owner operator, 38.7% respondents are hired operator while only 0.05% respondents are hired purchased operator.
- (iv) Greater part of the motorcycle operators, i.e. 77.9% operated for more than 7 hours a day, 13.1% constitutes those that operated between 6 – 7 hours, 7.7% for 4 – 5 hours, 1.34% falls below three hours.
- (v) The study reveal that 18.3% said they are engaged in motorcycle business to raise money for other business start-up, majority of the respondents (i.e. 54%) said they are engaged in this business to be self-employed, those who are influenced by friends or have passion for the business are only 6%, 0.02% respondents said it is a post formal job for them just to complement their salaries and 19.67% said the reason they are engaged in the sector is due to the absence of formal sector job.

- (vi) The major determinants of income generation on the impact assessment of commercial motorcycle transport on job creation and income generation in Jigawa state are hours worked per day, years of experience, ownership status, daily savings, daily fuel purchase, and number of commercial motorcycles.

## CONCLUSIONS AND POLICY RECOMMENDATIONS

Considering the research findings and the objectives of the study, the paper concludes that; Commercial motorcycle in Jigawa state is a business activity which yield income to the operators and are not captured in the national income. Also, the paper concludes that the commercial motorcyclist in Jigawa state operated for more than seven (7) hours a day, and that a commercial motorcyclists earn a minimum of N300 and a maximum of N1,200 daily or a minimum of N9,000 and maximum of N36,000 monthly. This amount is more than the minimum wage been paid by the government. And finally, the study revealed that majority of the respondents are engaged in this business to be self-employed,

From the findings above, the following policy recommendations are proffered:

1. Government should formalize and regulate the activities of commercial motorcycle operators to strengthen the business. In this way, transport service delivery to the people will be enhanced; earnings of the *Okada* riders will equally be improved to maximize their welfare.
2. Government should mandate training inform of safety classes and issue license to the trainees after they complete the training. This can be driving school for those who wish to be riding *Okada* as commercial transport. Similarly, the training should also incorporate health education and relevant law that guide the road safety for the protection of riders and their passengers, and to avoid accident on the road. By doing this, it would help the *Okada* riders to make more money per day as road is safe and lives of passengers are guaranteed. The more the passengers take *Okada* as a means of transport the more money the riders can make per day and eventually overcome their economic problem.
3. The commercial motorcycle riders should be encouraged to save more of these incomes than spending, since most of them are youth. This can be used by them to make a future investment.

## ACKNOWLEDGEMENTS

This work is an attempt to publish some part of our funded field research by TET Fund Nigeria, under grant reference number: Ref: FUD/URCP/ECO/FASS/TET Fund 2016/June. The authors would like to acknowledged and express their gratitude to the helpful comments of team members and those that participated in the research, especially Prof. Ibrahim Ahmed Kiyawa who is the lead researcher.

## REFERENCES

- Abiodun O. A. (2013). HIV/AIDS related sexual behavior among commercial motorcyclist in Shagamu – South- West, Nigeria. *International Journal of Medicine and Biomedical Research*. 2(1): 23-31.
- Adesanya, A. (1998). The use of motorcycles for public transportation in Nigeria: The situation in Ibadan, *NISER Monograph Series*, No. 6. Ibadan: Nigerian Institute of Social and Economic Research (NISER).
- Adetunji, M.A. & Aloba, O. (2014). The level of compliance of commercial motorcyclists to traffic rules on urban roads in South Western Nigeria. *Journal of Educational and Social Research MC SER Publishing, Rome-Ital*. 4(3): 345-351
- Adeyemo, M.A. (1998). An appraisal of motorcycle as a commercial passenger transport mode in Port Harcourt metropolis. *Journal of Transport Studies*. 2 (1): 77-89.
- Ajay, K. (2011). Understanding the emerging role of motor-cycles in African cities: Sub-Saharan Africa Transmit Policy Program (SSATP). *Discussion Paper No. 13, Urban Transport Service*. A political economy perspective, Retrieved from [www.worldbank.org/cifr/ssatp](http://www.worldbank.org/cifr/ssatp) accessed: 21<sup>st</sup> December, 2016.
- Arosanyin, G.T. (2010). Earnings from commercial motorcycle operations in Ilorin, Nigeria: A study on determinants. *Ghana Journal of Development Studies*. 7(2): 53 – 66
- Arosanyin, G.T., Olowosulu, A.T. & Oyeyemi, G.M. (2011). Employment generation and earnings in the informal transport sector in Nigeria. *International Business Management*. 2(2):139-148.
- Becker, G. S. (1975). *Human Capital*; Columbia University Press, New York; for National Bureau of Economic Research.

- Christopher, E.M; Usman, A.O. & Eke, C.C. (2013). Abolition of commercial motor-bikes and implications on transportation and criminality in Calabar metropolis. *International Journal of Social Sciences Studies*. 1(1): 15 – 29
- Kaffo, C.; Kamdem, P.; Tatsabong, B. & Diebo, L.M. (2008). L'intégration des "motos-taxis" dans le transport public au Cameroun ou l'informel à la remorque de l'Etat : une solution d'avenir au problème de mobilité et de l'emploi urbain en Afrique subsaharienne, Retrieved from [www.ville-enmouvement.com/taxi/telechargements/pptkamdem.pdf](http://www.ville-enmouvement.com/taxi/telechargements/pptkamdem.pdf) accessed: 21<sup>st</sup> December, 2016.
- Mincer, J. (1974). *Schooling Experience and Earnings*. Columbia University Press, New York.
- Nwaorgu, F. (2013). Nigeria: The ban on commercial motorcyclist. *On Line Nigeria*. Retrieved from <http://www.onlinenigeria.com/articles/ad.asp?blurb=856> accessed: 21<sup>st</sup> December, 2016.
- Odidi, G. (2012). Between some nigerian state governors and okada riders. Online: [www.nigeriafilms.com/...some-nigerian-state...okada-ri.html](http://www.nigeriafilms.com/...some-nigerian-state...okada-ri.html) accessed: 21<sup>st</sup> December, 2016.
- Ogunsanya, A.A. & Galtima, M (1993). "Motorcycle in public passenger transport service in Nigeria: case study of Yola town" In: S.G. Ikya ed. *Urban Passenger Transportation in Nigeria* Ibadan: Heinemann Educational Books: 190-207.
- Ojekunle, J.A. (1998). Operations and Use of Motorcycles as a Mode of Public passenger Transport" In Dange, H., Chikolo, I.V. and Ogunsanya, A.A. eds. *Issues in Transport Planning and Management* Zaria: Nigerian Institute of Transport Technology: 84-103.
- Olubomehin, O.O. (2012). The development and impact of motorcycles as means of commercial transportation in Nigeria. *Resource Humanity Social Science*. 2(6):231–239.
- Olvera, D.L.; Plat, D. & Pochet, P. (2007). Household transport expenditure in Sub-Saharan African cities: Measurement and Analysis. *Journal of Transport Geography*.
- Taruwere, Y.A. (2012). Determinants of earnings among commercial motorcycle operators in Kwara state, Nigeria. *International Journal of Economics and Management Sciences*. 2(2): 11-17

**Impact of Commercial Motorcycle Transport in Raising Income: Evidence from Jigawa State, Nigeria**

World Bank. (2002). *Cities on the move: a World Bank urban transport strategy review*. Washington D.C.: World Bank publications.

Sodipe, O. A. & Ogunrinola, I. O. (2011). Employment and economic growth nexus in Nigeria. *International Journal of Business and Social Science*. 2(11): 232-239

**APPENDIX: Income Generation Model Result**

Dependent Variable: INCC

Method: Least Squares

Date: 08/12/16 Time: 15:42

Sample (adjusted): 1 299

Included observations: 215 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NHWD	3.747483	44.04644	0.085080	0.9323
EXPC	5.734075	2.766656	2.072566	0.0394
OWS	26.33723	42.11143	0.625418	0.5324
SVGC	0.629134	0.131004	4.802416	0.0000
FPD	1.247891	0.175232	7.121346	0.0000
NCM	6.225254	54.99755	0.113191	0.9100
C	451.6188	250.3720	1.803792	0.0727
R-squared	0.314956	Mean dependent var		1294.651
Adjusted R-squared	0.295195	S.D. dependent var		413.7042
S.E. of regression	347.3156	Akaike info criterion		14.57036
Sum squared resid	25090656	Schwarz criterion		14.68010
Log likelihood	-1559.314	Hannan-Quinn criter.		14.61470
F-statistic	15.93836	Durbin-Watson stat		1.570938
Prob(F-statistic)	0.000000			

**Heteroskedasticity Test: Breusch-Pagan-Godfrey**

F-statistic	0.376925	Prob. F(6,208)	0.8932
Obs*R-squared	2.312515	Prob. Chi-Square(6)	0.8888
Scaled explained SS	2.455963	Prob. Chi-Square(6)	0.8734

**Impact of Commercial Motorcycle Transport in Raising Income: Evidence from Jigawa State, Nigeria**

**Normality Test**

