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Original Research Paper

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EFFECT OF MOTORCYCLE OPERATOR'S PROFESSIONALISM ON RURAL HOUSEHOLD INCOME: A CASE OF MOTORCYCLE OPERATORS IN EMBU COUNTY, KENYA

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ABSTRACT The use of motorcycles in developing countries especially in Kenya has become a phenomenon that is inevitable now. Its efficiency as a mode of transport is open to question and its external effects can be criticized, one can still ask whether the motorcycle taxi is an occupation that prevents individuals from sinking deeper into poverty or if the job improves the living conditions of operators. The main purpose of this study was highlight and analyze the effect of operator's professionalism sector on rural household incomes. The study used random utility maximization model which is based on random utility theory and welfare economics theories and multinomial logistic regression model was estimated. From the results, most of the motorcycle operators earn on average between Kshs 600-1000. Majority had a valid driving license (66.10%) while 33.90 did not had. Those above 4 years' experience cumulated to 62.99%. Multinomial logistic regression results showed that experience positively and significantly affected rural daily income above Kshs1000. Inconclusion, Motorcycle transport provides operators with employment opportunities coupled with provision of not only meager subsistence income but sufficient to generate more economic activities. Therefore, study recommends that both county and national government should organize regular training for motorcycle operators on customer care, safety and precaution.

KEYWORDS : Motorcycle, Multinomial Logistic, Kenya.

1. INTRODUCTION

In developing countries, motorcycles are the most essential and effective means of transport in daily life and overall livelihood (World Bank, 2015). A study done by Ogunsanya and Galtima (1993) on the use of motorcycle as means of public passenger traffic in Yola town, Adamawa State, identified economic depression and inadequate transport facilities as some of the factors that gave rise to the use of motorcycles as means of public transportation in Nigeria (Ogunsanya and Galtima, 1993). Adesanya (1998) focused on the evolution of motorcycles for public transportation in Ibadan, Nigeria. This paper looked at the economic profiles of motorcycle operators, the characteristics of public motorcycles operations and the impact of motor bikes on daily income to their households. Another writer, Fasakin (2001) also did a study on the factors affecting the daily profits of commercial motorcycle operators in Akure, the capital of Ondo State, South West Nigeria (Fasakin, 2001). Kayode, dealt with the subject of public transportation in his Inaugural Lecture. Among other issues, the study looked at the rise in the use of "*Okada*" for public transportation in Nigeria pointing out that the decrease in the supply of new vehicles of all types since the 1970s contributed to the emergence of motorcycles for commercial transportation (Oyesiku, 2002).

According to Layton *et al.,* (2007) informal transport is the most successful form of suitable transport in the world, although transport sector in Africa is generally underdeveloped and this constitute a major challenge to the development of the continent. He emphasizes that more significantly is the fact that most of transport investments in Africa focus on promoting motorized transport. Accordingly, less than 1% of the households in Africa have access to private motorized transport which has enormous costs (Layton *et al.,* 2008).

Therefore, according to Otuya *et al.,* (2011) majority of Africans must walk. The report indicates that this wastes a lot of time and severely limits their opportunities to participate in economic activities. He argues that boda-boda which includes bicycles and motorbikes are low-cost mode of transport which can drastically improve people's mobility and have realistically been made accessible to most African economies. He further argues that for the enterprise to make positive contribution to the transport sector there is need for proper operational and management skills in such aspects of motorcycle proficiency, enterprise management, traffic rules and first Aid. However, empirical evidence from this report suggests that due to lack of entry behavior, many Kenyans jump at opportunity to purchase a boda-boda with view to start a boda-boda tax business irrespective of skill status.

2. Literature Review

Motorcycles are one of the most affordable forms of motorized transport in many parts of the world and for most of the world's population; they are also the most common types of motor vehicle (Minju, 2011). As of 2002, India Mopeds was one of the largest numbers of motorized two wheelers in the world, China a close second with 34 million motorcycles/mopeds (Broughton, 2005). Cervero (2000) noted other violations which include lack of liability insurance, absence of a commercial driving permit, and operation of an unclassified or substandard vehicle. Informal transport services are also notable for their role as "gap filers". They assist in large part to fill service voids left unfilled by formal public transport operators. The study indicates that rapid motorization, poor road facilities, inability to strategically plan have given rise to horrendous levels of traffic congestion and air pollution. He argues that in many mega-cities of developing world, formal public transport operators exist as protected monopolies, and accordingly lack the incentive to contain costs, operate efficiently, innovate, or respond to shifting market demands.

He further argues that buses are often old, break down periodically and get stock in slow moving traffic. According to the study fares are frequently kept low to help the poor, however this reduces revenue intake which in turn precludes service improvements. The study indicates that all too often throughout the developing world, public transit finds itself in a free fall of deteriorating service and shrinking incomes. The study concludes that it is only because regulations and rules are laxly enforced that unlicensed operators are "informally" able to step in and pick up where public transport operators have left off.

Plying the streets of Bangkok, Lagos, Sao Paulo, and other cities of the developing world are fleets of small, low

performance vehicles driven by private operators that serve low-income neighborhoods Cervero (2000). The scholar further notes that in some places, environmentally friendly pedal powered modes, like the pedicabs of mamilla, provide lifts between markets and squatters whose narrow alleys and walkways are impenetrable by motor vehicles. In other places, like Kingston, Jamaica, station wagons and mini vans fiercely compete head-to-head with public buses, providing curb to curb delivery for premium fare.

Cervero (2000) showed that in increasing numbers of cities and towns around the world, dozens of young men on mopeds and motorcycles Congregate at major intersections, offering feeder connections between mainline bus routes and nearby neighborhood for affordable fare. He revealed that these privately-operated small-scale services are varyingly referred to as "par transit", "low-cost transport", "intermediate technologies," and "third world transport." He used the term informal sector to reflect the context in which this sector operates informally and illicitly, somewhat in the background, and outside the officially sanctioned public transport sector. He emphasized while private, small vehicle, for- hire services, such as taxis, can be found in all cities of the world, what separates informal transport operators from others is that they lack, to some degree, official and proper credentials. That is, they are unsanctioned. He further noted that some instances, operators lack the necessary permits or registration for market entry in what is a restricted, regulated marketplace. He revealed that in other instances, operators fail to meet certification requirements for commercial common.

In Kenya drivers and vehicle licensing of motorcycles generate revenue. Municipal Council byelaws require that all motorcycle owners buy and stick stickers on their motorcycles. Court fines from deviant motorcyclists contribute to revenue generation. A good number of mechanics, commercial motorcycle spare parts dealers and increased number of fuel filling stations derive their livelihoods and operations on commercial motorcycles (Karema, 2013).

3. METHODOLOGY

In view of the philosophical orientation, the study employed explanatory survey research design as it sought to describe and establish the associations among the key study variable namely; motorcycle operator's professionalism and rural household income. Explanatory design is used where theories are used as basis for understanding and explaining practices or procedures (Saunder *et al.,* 2003). A survey-based method deemed appropriate to examine the relationship between the variable and rural household income. Other advantage to using survey for this research include cost effectiveness, flexibility, and efficiency in collecting large amount of data for statistical analyses and the quick turnaround in the data collection phase (Babbie 2009). Finally, the study was cross-sectional (that is snapshot or one-shot) as the research respondents were interviewed just once, Cross-sectional studies have been found to be robust for effects of relationship studies (Coltman, 2007).

The study targeted an accessible population of 13,550 motorcycle operators and a total of 354 were sampled and interviewed. Closed-ended questions were used to save time and to motivate the respondent to answer. The multinomial logistic regression model was estimated because it is one of the regression models for dichotomous data. It is appropriate when the response variable takes more two possible outcomes representing success and failure, or more generally the presence or absence of an attribute of interest. The aim of multinomial logistic regression model is to determine the probabilities of choice from a given alternative categories for example the dependent variable in this case has three categories. Those motorcycle operators able to earn daily income less than Kshs 500 were in one category, earning between Kshs 600-1000 in the same category and final category were those able to earn above Kshs 1000. For all models developed in this study, a model with J categories and K explanatory variables can be expressed directly in terms of alternative probabilities (Pi) (Greene & Hensher, 2007).) as follows.

$$p_i = \frac{exp(\alpha_i + \sum_{k=1}^{K} \beta_{ik} X_k)}{\sum_{j=1}^{J} exp(\alpha_j + \sum_{k=1}^{K} \beta_{jk} X_k)} \quad j = 1,\ldots i\ldots J \quad k = 1\ldots K$$

Where, α_i is the constant $\beta_i k$ the coefficient of the explanatory variable k and X_k is an explanatory variable k. Model performance is indicated by several statistical values, such as the Log-likelihood estimate, Pseudo R-square value, Chi-square, and prediction accuracy. Using Maximum Likelihood estimation (Louviere et al., 2000), a set of utility function coefficients which makes the model best fit the calibration dataset are estimated. Coefficients with t-statistics value greater than 1.96 (significance value 0.05) are judged statistically significant. The coefficients estimated are subsequently used for interpreting the relationships between explanatory variable (Motorcycle Operators professionalism) and rural household income per day.

4. RESULTS

Multinomial Logistic Regression- Multinomial logistic uses log odds of the outcomes modeled as a linear combination of the predictor variables. For instance, in this study the predictor variables are motorcycle operator's professionalism which is proxied by experience in motorcycle operation, being trained, having a valid driving license and length of training.

Table 1: Multinomial Logistic Regression Results

Iteration 0: log likelihood = -267.4641				
Iteration 1: log likelihood = -236.64691				
Iteration 2: log likelihood = -235.84944				
Iteration 3: log likelihood = -235.70043				
Iteration 4: log likelihood = -235.66658				
Iteration 5: log likelihood = -235.65824				
Iteration 6: log likelihood = -235.65656				
Iteration 7: log likelihood = -235.6562				
Iteration 8: log likelihood = -235.65612				
Iteration 9: log likelihood = -235.6561				
Multinomial Logistic Regression		Number of Obs.		=354
		LR chi2(12)		= 63.62
		Prob > chi2		= 0.000
Log likelihood = -235.6561		Pseudo R2		= 0.1189
INCOME_PER_DAY	**Coef.**	**Std. Err**	**Z**	**p >|z|**
Less than 500				
Experience	-0.4131	0.5081	-0.51	0.416
Training	12.8328	461.7290	0.03	0.978
Having a valid driving license	-1.6368	1.0764	-1.52	0.128
Length of training	0.0626	0.3719	0.17	0.866
Constant	-12.3256	461.7346	-0.03	0.979
600-1000	**(base outcome)**			
Above 1000				
Experience	-1.0868	0.1899	-5.72	0.000
Training	-0.9066	0.2929	-3.10	0.002

Having a valid driving license	-0.5292	0.2685	-1.97	0.049
Length of training	-0.0334	0.1235	-0.27	0.787
Constant	4.9955	0.8484	5.89	0.000

Note: '*' indicates significance at 5 percent level.

Source: Survey Data, 2020

The results presented in Table 1 are for the multinomial logistic regression. The output is made by several element. The first one is the **iteration log** that indicates how quickly the model converges. The first iteration (Iteration 0) is the log likelihood of the null or empty model; that is, a model with no predictors (independent variables). It is clearly observed that at each iteration, the log likelihood increases because the goal is to maximize the log likelihood. When the difference between successive iterations is exceedingly small, the model is said to have attained convergence and the iterating stops. The model converged after 9 iterations and its log likelihood value was -235.6561. This indicates how quick the model converged.

The log ratio (LR) test was 63.62 and its significance of probability 0.000 showed that the model (multinomial logistic model) was fit. The rural household income per day had to three categories, those who earned less than Kshs 500, those had daily earnings between Kshs 600-1000 (baseline outcome) and the final category were those who had daily earnings above Kshs 1000. The researcher chose those in group 600-1000 to compare the low earners and high earners. So, the base indicates the category used for the baseline comparison group.

Those earning less than Kshs 500, all the motorcycle operator's professionalism measures did not show any significance on rural household. But motorcyclist earning above Kshs 1000, showed that experience, training and having a valid driving license significantly influenced the daily household income in this region.

Table 2: Relative Risk Ratio Coefficients

Multinomial Logistic Regression		Number of Obs.		=354
		LR chi2(12)		= 63.62
		Prob > chi2		= 0.000
Log likelihood = -235.6561		Pseudo R2		= 0.1189
INCOME_PER_DAY	**RRR**	**Std. Err**	**Z**	**p >|z|**
Less than 500				
Experience	0.6616	0.3362	0.81	0.416
Training	374289.2	1.73e+08	0.03	0.978
Having a valid driving license	0.1946	0.2065	-1.52	0.128
Length of training	1.0646	0.3959	0.17	0.866
Constant	4.44e-06	0.0020	-0.03	0.979
600-1000	**(base outcome)**			
Above 1000				
Experience	0.3373	0.0640	-5.72	0.000
Training	0.4039	0.1183	-3.10	0.002
Having a valid driving license	0.5891	0.1581	-1.97	0.049
Length of training	0.9672	0.1195	-0.27	0.787
Constant	147.7529	125.3588	5.89	0.000

Note: RRR refer to relative risk ratio, '*' indicates significance at 5 percent level

Source: Survey Data, 2020

Relative Risk Ratio Coefficients- Since the multinomial logistic regression is a probabilistic, then determining the odd ratios is important. Relative risk also referred to as odds ratio is the ratio of the probability of choosing one outcome category over the probability of choosing the baseline category. Relative risk can be obtained by exponentiating the linear equations coefficients above (coefficients of multinomial logistic regression results), yielding regression coefficients that are relative risk ratios for a unit change in the predictor variable.

The results in Table 2 shows that instead of coefficients as experienced in the linear regression above (Table 1), we have RRR. These are the relative risks ratios coefficients. The odds of a motorist making daily income above Kshs 1000 as wells as having experience was 0.3373 (exponentiating -1.0868). This is a coefficient of relative risk for a unit change in motorcycle operator's experience to affect motorcycle daily income above Ksh.1000. Further, the odds of being trained and making daily income above Ksh.1000 was 0.4039 The relative risk ratio for motorcycle operators' having a valid driving license and the length of training costs were 0.5891 and 0.9672, respectively.

Because the relative risks ratios were less than 1, the percentage decrease in risk for having less experience and making income above Ksh.1000 reduced by 33.73%. This means that those motorcycle operators having experience had 33.73 percent less risk of making income above Kshs 1000. Meaning experience enables them to attain higher income. Similarly, being trained affects higher daily income by 40.39% reduction in risk and having a driving license and duration of training costs affected motorcyclist to earn more daily incomes by 58.91% and 96.72% respectively.

5. Conclusions and Recommendations

From the study findings, it can be concluded that there were significant associations between the independent variable, motorcycle operator's professionalism and the dependent variable, rural household income. It can, therefore, be concluded that; motorcycle operators' professionalism has significant effects on rural household income in Embu County, Kenya. Motorcycle operators provide informal transport services paratransit-type services provided without official sanction and can often be difficult to rationalize from a public policy perspective. Further, motorcycle transport provides operators with employment opportunities coupled with provision of not only meager subsistence income but sufficient to generate more economic activities. While these systems provide benefits including on-demand mobility for the transit-dependent, jobs for low-skilled workers, and service coverage in areas devoid of formal transit supply, they also have costs, such as increased traffic congestion, air and noise pollution, and traffic accidents. To curb these congestions accidents, government need to promote motorcyclist and ensure they are more professional through rigorous trainings. Theses trainings may include first aid techniques incase of accident, proper driving, law enforcement and many others. The Kenya government may offer scholarships or provide incentives to these motorcyclists as a way of promoting them to acquire necessary skills and have proper documents such as driving licenses, insurance covers etc.

REFERENCES

1. Adesanya, 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.
2. Babbie, E. (2009). The practice of social research United States: Wadsworth Cengage Learning.
3. Broughton, D., (2005). The complete guide to insufficiency, New York, NY. Chronicle Books
4. Cervero, R., (2000). Informal Transport in the Developing World. Nairobi: United Nations Commission on Human Settlement.
5. Coltmant, (2007). can superior CRM capabilities improve performance in banking? *Journal of Financial Services Marketing*, vol 12.
6. Fasakin, J. (2001). Some Factors Affecting Daily Profits of Commercial Motorcycles in Akure, Nigeria. *Transport Policy*, Volume 8, Issue 1, p. 63-69.
7. Greene, W. H., & Hensher, D. A. (2007). Heteroscedastic control for random coefficients and error components in mixed logit. *Transportation Research Part E: Logistics and Transportation Review*, *43*(5), 610-623.
8. Karema, F.M., (2015). The role of commercial motorcycles in the rural economy:A case study of Laikipia East Sub-county, Kenya.
9. Layton Bradley & Lauren Jablononiski, Ryan Kirby, Nick Lampe (2007). Bicycle infrastructure development strategy for suburban commuting." ASME International mechanic Engineering congress and Exposition November 11-15, 2007, Seattle, Washington

10. Louviere, J., D. Hensher and J. Swait (2000),Stated Choice Methods: Analysis andApplications, New York: Cambridge University Press.
11. Minju, E. M. (2011). *An assessment of training and safety needs of motorcyclists in Kenya* (Doctoral dissertation).
12. Ogunsanya A. A. & Galtima M. (1993). Motorcycles in public passenger Nigeria, Ikya (ed) Heinemann Education Books (Nig) Plc Ibadan
13. Otuya, W. I, Achokas.K, Musebu R. O., & Acharg. O. (2011). Management of bicycle taxi operations in Kenya; A case of boda-boda in Kakamega town.
14. Oyesiku, O. K. (2002). Policy framework for urban motorcycle public transport system in Nigerian cities. *Urban Mobility for All, Lisse: AA Balkema*, 255-261.
15. Saunders, P, M, Lewns, & Thornhill, A. (2003). Research methods for business students (3 rd Ed) Prentice Hall (London).
16. World Bank (2015). A Measured Approach to Ending Poverty and Boosting Shared Prosperity: Concepts, Data, and the Twin Goals. Policy Research Report. Washington, DC: World Bank