
Economic Contributions of Tricycle Transportation on Revenue Generation in Kaduna Metropolis, Nigeria

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ABSTRACT

The study examines how tricycle transportation affects Kaduna Metropolis's ability to generate income. The study distributes a structured questionnaire using cluster sample approaches. For the study, 370 respondents made up the sample size. With a substantial p-value of 0.00000, the logistics results demonstrate that the model iteration rapidly converged, indicating that the model is a strong match for forecasting the dependent variable. With an R-squared value of 0.756006, the independent factors account for around 75.6% of the variation in the dependent variable. According to the regression analysis, there is a 1.5 Naira rise in state revenue for every unit increase in tricycle registration, which is statistically significant at the 1% level. Additionally, with a p-value of 0.0013, a 1.1 Naira gain in revenue results from a 1-unit increase in the tax levied on tricycle operators as a result of moving to a different local government. Last but not least, a 0.9 Naira rise in revenue is the result of a 1 Naira increase in fines for tricycle violations. This is probably because the fines have a deterrent impact. In order to ensure that the tax burden does not impede the sector's growth, the study advised local governments to investigate the possibility of implementing or modifying taxes in a fair and transparent manner.

Keywords: Transportation, Revenue Generation, Economic, Tricycle

Introduction

In emerging nations like Nigeria, where efficient networks are necessary for mobility and economic activity, transportation is especially important to the economic growth of urban regions (Ibrahim, 2017). Because they are inexpensive, effective, and capable of navigating crowded metropolitan areas, tricycles, sometimes referred to locally as "Keke Napep," have become an essential form of transportation in Nigerian cities

like Kaduna Metropolis. Tricycles' explosive growth has changed urban mobility and opened up substantial economic potential, especially in terms of job creation and income production (Adebayo & Samuel, 2020).

Tricycles serve as a low-cost transport solution for both passengers and goods, making them indispensable in cities like Kaduna, where other forms of public transport may be inadequate or unaffordable for a large portion of the population (Ogunyemi, 2018). Despite their importance, the economic contributions of tricycles, especially in terms of local government revenue generation, remain underexplored. Understanding how this informal transportation sector can contribute to the local economy is essential for governments seeking to harness its potential to generate revenue, create jobs, and stimulate growth.

This essay examines the economic contributions of tricycles in Kaduna Metropolis, focusing on local tax revenues, employment creation, and support for local businesses. It also investigates the challenges faced by local authorities in regulating and capturing revenue from this sector. Despite the growth in tricycle use, the regulatory framework for managing those remains underdeveloped, leading to inefficiencies and missed opportunities for revenue generation (Sulaimon & Usman, 2019). The sector faces challenges such as a lack of standardization, insufficient tax enforcement, and inadequate infrastructure to support the growing number of tricycles, making it difficult for local governments to fully benefit from their economic potential.

In other to address these issues, it requires a comprehensive investigation into the contributions of tricycles and the development of more effective policies for regulation and taxation.

Objective

Examine the contribution of commercial tricycle transportation on revenue generation to Kaduna State government

Research question

What is the contribution of commercial tricycle transportation to local government revenue generation in Kaduna State?

Hypothesis

- H_0 : Commercial tricycle transportation does not significantly contribute to revenue generation for the Kaduna State government.

- **H₁:** Commercial tricycle transportation significantly contributes to revenue generation for the Kaduna State government.

Literature Review

Conceptual Review

Transportation: Transportation refers to the movement of people or goods from one location to another, typically using vehicles, infrastructure, and systems designed for efficient flow. In many economies, transportation networks are critical for economic activity. *Transportation serves as the backbone of economic development, connecting regions, enabling trade, and supporting mobility.*

Revenue: Revenue in the context of transportation often refers to the income generated by operators, governments, or businesses through the provision of transport services, such as fare collection, licensing, or public-private partnerships. *Revenue generation in transport comes from fares, registration, and public-private partnerships that enhance service coverage*

Economic: Economics in transportation concerns the financial impact of transport systems, including costs, benefits, and externalities. It also includes how these systems affect local and national economies, such as boosting commerce or creating jobs. *Economic impacts of transportation extend beyond the movement of goods, affecting job creation, local commerce, and broader productivity.*

Tricycle: A tricycle is a three-wheeled vehicle commonly used in transportation, especially in urban or rural areas where larger vehicles are impractical. Tricycles are often used for both passenger and goods transport, providing a low-cost, flexible solution. *Tricycles provide an accessible, low-cost form of transportation, particularly in areas with limited infrastructure or traffic congestion.*

Empirical Review

The informal sector in classical literature refers to economic activities that are not taxed or regulated by the government. In Nigeria, due to declining oil revenues, the informal sector, particularly the motorcycle transport business known as “Okada,” has been subjected to government taxation and monitoring to boost state revenue. However, there has been little research on how this has affected Ebonyi State’s internally generated revenue (IGR) between 2015 and 2021. The study, based on Public Choice Theory, analyzed primary and secondary data to determine if taxing the Okada business

improved Ebonyi's IGR. The findings revealed that despite intensive taxation of the informal sector, particularly Okada operations, the state's IGR actually decreased rather than increased (Ikechukwu et al. 2024). The study recommends that the government improve efficiency in tax collection and remittances to boost IGR effectively.

Uforo (2023) investigated tricycle Operation and Socio-Economic Development within Uyo Metropolis. The study used a survey research technique, gathering data from 400 Keke riders out of 10,500 registered in Uyo, through primary and secondary sources. It applied the economic development framework to examine how transportation, specifically tricycle operations, contributes to socio-economic growth. The findings highlighted several benefits: tricycle operations generate revenue for the State Ministry of Transport through taxes and registration fees, create employment opportunities both directly (for riders) and indirectly (for spare parts dealers and mechanics), and facilitate the movement of people and goods, even to rural areas.

Austin and Ugochukwu (2023) examines the role of tricycle as a means of Poverty Alleviation Programme in Alimosho Local Government. Tricycle is one of the mode of land transport that has provided job opportunities for youths across Nigeria. Both the Federal, state and private individuals have invested in this means of transportation so as to assist the youth and help reduce crime and rate of social malaise rocking Alimosho local government and its environs. The paper employs primary and secondary sources as interviews were granted to tricycle riders to ascertain their opinions on the programme. The findings show that unlike other means of poverty alleviation programme that had been introduced since independence, tricycle transport is the most dependable and lasting programme that endured overtime.

Isalako et al. (2022) examines the effects of using tricycles for public transportation in Ijede, Lagos State, focusing on socioeconomic traits of operators, operational aspects of tricycles, service demand, and safety concerns. Findings revealed that many tricycle drivers operate to support their families due to unemployment. Challenges identified included law enforcement issues, poor road conditions, extortion, and reckless driving to avoid arrests, which often led to accidents. These problems contributed to high operational costs, especially maintenance, task force dues, and payments to local authorities and unions. Statistical analysis (Pearson correlation of 0.721, significant value of 0.000) indicated a significant relationship between the number of days drivers work and their involvement in accidents. Despite these challenges, tricycles have positively impacted society by reducing unemployment, crime, and travel time, while contributing to the Nigerian economy.

Amade et al. (2024) examine An Appraisal of The Socio-Economic Impact of Commercial Tricycles in Yola Metropolis, Adamawa State, Nigeria This study examines the socio-economic impact of commercial tricycles in Yola metropolis, Adamawa State. The study was conducted using cross-sectional data, which were collected using well-structured questionnaires. A sample of 366 was drawn from a population of over 9000 tricycle riders in Yola metropolis using multi-stage sampling techniques. The data collected were analyzed using logistic regression analysis techniques. The results of the analysis suggests that that age, marital status, level of education, place of residence, ownership of tricycle and being a tricycle rider are significantly more likely to have significant impact on the overall income of the tricycle riders in Yola metropolis, Adamawa State. The study recommends among others that the government of Adamawa State consider the introduction of an empowerment program where people will be given tricycles, either on hire purchase or people should provide at least 40 percent of the total cost.

Jibrilla and Fashola (2017) explored the Impact of Commercial Tricycle Operation on Income of Youth in Mubi North Local Government Adamawa, State Nigeria . Data for the study were obtained from primary source using questionnaire. Hundred questionnaires were distributed and all were completed and returned. The data were analyzed using simple percentage and multiple regressions. The findings of this research revealed that, the tricycles mean of transport in Adamawa state has increased the income of youth through generation of employment opportunities and is has also reduced the rate of accident compare to Okada. It is recommended that, there should be more skill-acquisition and resettlement scheme in Mubi North local government which will enable youth acquire skills and training in various field. Also, soft loans should be granted to youth to procure commercial tricycles.

Lawal (2014) carried out a study on an evaluation of poverty reduction programme in Maiduguri metropolis Area, from 2003 to 2012 in Borno State. Data for the study were generated through questionnaire and in-depth interview. One hundred beneficiaries were selected through proportionate sampling and administered with questionnaire. The study revealed that these beneficiaries received different materials as assistance in order to improve their living standard. It was discovered that most of the beneficiaries engaged in commercial tricycle for survival.

Christopher, Usman, and Eket (2013) conducted a study on introduction of commercial tricycle and its implication on transportation in Calabar metropolis. The study employed simple percentages and chi-square through structure questionnaire.

The findings revealed the riders of motorcycles among others have moved to tricycles business in the state.

Theoretical Framework

Neoclassical Economic Theory: Marginal Productivity and Capital Accumulation

Building on classical ideas, neoclassical economic theory places a strong emphasis on the concept of marginal productivity, where investments in infrastructure (including transportation) are viewed as capital that improves the productivity of labor and other factors of production. According to this theory, the construction of efficient transportation networks increases the marginal productivity of labor by reducing commute times and improving access to job opportunities, thus boosting overall productivity in the economy.

Furthermore, neoclassical economics also underscores the role of capital accumulation in driving growth. Investment in transportation infrastructure is seen as a form of capital investment, which, when managed properly, can generate returns over time in the form of enhanced productivity and economic growth. The capital accumulation theory suggests that well-planned transportation systems foster an environment conducive to higher levels of private investment and business activity, ultimately contributing to long-term economic development.

Methodology

The population of the study covers the tricycle operators in Kaduna North, Igabi, Chikun and Kaduna South Local Government Area with a population of 15,000 registered commercial tricycle operators (ACOTMORAN, 2016). However, 370 operators were used as the sample size. The sample size for the study was arrived at using Yamane (1967) sampling model as adjusted by Smith (1983) and cited in Usman and Umar (2013).

$$\text{Thus: } n = \frac{N}{3 + N(e)^2} = 370.3 \approx 370 \quad \text{--} \quad \text{--} \quad \text{--} \quad (1)$$

Where: n = The desired sample size, N= The population size, 3= Adjusted constant value, e= Level of precision (significant level). This is usually set at 0.05 and occasionally at 0.01.

Using the above formular, the research used the sample size of 370 tricycle operators, given that the population of the tricycle operators are 15,000. The cluster sampling technique was used in selecting the sample from the major leading points

of tricycle riders in Kaduna Metropolis, which were selected from 16 loading points. In each of the leading points, questionnaires were randomly administered to the tricycle operators who served as the respondent. Primary data were collected with the help of branch union's secretaries through a well-structured questionnaires and observations. The questionnaire designed to generate relevant information required to enable to achieve the objective.

In order to establish the factors that influence the revenue in the status of the parameters of the model were estimated used the multivariate logistic regression model used for this study; the endogenous variable is dummy variable with a value 0 indicating the presence of revenue and 1 indicating the absence of revenue. Following **Neoclassical Economic Theory** who was developed **Adam Smith (1723-1790)** and adopting the model as specified by Gujarati and Porter (2009), the model for this study is specified thus:

Model one is to achieve objective

$$Y = \frac{P_i}{1-P_i} = Z_i = \beta_0 + \beta_1 \text{REG}_i + \beta_2 \text{LGAO}_i + \beta_3 \text{WkO}_i + \mu_i$$

Where :

Z_i = Tax as the income to the government

$\beta_1 - \beta_3$ = parameters

β_0 = intercept μ_i = error term

REG= Commercial tricycle riders pay for registration is dummy if the pay to the government =1, otherwise=0.

LGAO= tricycle operators do pay dues when the cover more than one local government area is dummy if the pay such dues to the government=1, otherwise=0.

WKO=commercial tricycle riders do pay for offence committed weekly is dummy if the pay to the government=1, otherwise=0.

A Prior Expectation

For the two models, it is expected that, the signs and magnitude of parameters coefficient $\beta_1, \beta_2, \beta_3 > 0$ they are all positive.

Dependent Variable and in Dependable Variables

Z_i for the second model shows that it represents the dependable variable, while the independent variables constitute the activities that make the tricycle operators to pay

dues to the government at different levels. The choice of the variables in model two was adopted from the work of Amade, Ezekiel, . & Idi (2024).

Data Presentation

Table 1: Statistics on Returned Questionnaires

<i>LGAs</i>	<i>Area Cover</i>	<i>No. of Questionnaires Distributed</i>	<i>No. of Questionnaire Retrieved</i>	<i>No. of Usable Questionnaires</i>
Kaduna North/6867	UTC Junction Levant's round about Kano road junction U/Sarki junction	170	121	91
Kaduna South/4977	Kaduna Polytechnic main campus gate Kakuri junction bus stop Kurmi Mashi bus-stop U/Rimi bus- stop	122	86	61
Chikun/2009	Refinery junction Sabo main bus stop Romi junction Mararaban Rido junction	48	30	28
Igabi/1147	Rigasa Junction Riga chikun junction Mando junction by farin gida Airport junction by Turkeys academy	30	26	23
Total	16 major Tricycle junctions	370	263	203

Source: Field Survey, 2025

Table 1 showed the number of questionnaires used for the analysis in this study. From the table above, it is evidence that information were retrieved from the targeted sixteen major tricycle junctions in the Kaduna metropolis with the help of tricycle union secretaries.

From the 370 questionnaires distributed, 263 questionnaires covering 71.1 percent of the total questionnaires were retrieved. Reason for the un-retrieved questionnaires was due to the instability of the tricycle drivers as they are always mobile. The study retrieved 263 questionnaires, 203 representing 77.2 percent were found to be usable and were used for the general analysis of results in this study. This shows that adequate information needed for the analysis were gotten as the sample size is large enough.

The results of the descriptive analyzed presented in this section show the socio-demographic characteristics of the respondents and this was followed by the econometric analysis. Information relating to the socio-demographic characteristics of the respondents which include; gender, religion, age, nature of institution graduated from, faculty of respondents, academic grade and their entrepreneurial intention are provided in table 4.1.

Table 2: Demographic Characteristics of the Respondents

	<i>Variables</i>	<i>N=203</i>		<i>Variables</i>	<i>N=203</i>
1.	Gender:	(%)	3.	Age Bracket: (years):	(%)
	Male	99.5		20-30	29.6
	Female	0.5		31-40	47.3
				41-50	15.3
				51 above	7.9
2.	Marital Status:		4.	Level of Education:	
	Married	70		No formal Education	7.4
	Single	19.7		Primary Education	32.0
	Divorced	10.3		Secondary Education	50.7
				Post Secondary Education	9.9

Source: Field Survey, 2025

On the demographic characteristics of the respondents, the distribution of the tricycle operator according to gender characteristics shows that 202 of them signifying 99.5 per cent of them were male while 0.5 per cent was female. This shows that the men are the major operator of tricycle business in Kaduna State. In terms of marital status, the distribution was highly skewed towards the married as 147 of them which comprises of 70 per cent of them are married, 19.7 percent are single while 10.8 per cent are divorced. This show that majority of the operator of tricycle have dependence as they are married

Furthermore, the age distribution of the respondents shows that the tricycle operator were majorly youthful population between the age of 20 and 40. A total of 29.6 percent of them were distributed between age 20 and 30, while 47.3 per cent of them were distributed between 21 and 40 years. Only 15.3 percent and 7.9 percent of them were between 41-50 and over 51 years of age respectively. Moreover, on the level of education of the respondent majorly represented in this survey, 50.7 percent attend secondary education, 32 percent attain primary school level, and 9.9 percent attain post secondary

school level while 7.4 percent have no formal education. Despite having majority who are of secondary school level, it was found out that they have problem in reading and writing. This Therefore necessitate the use of junction secretaries to assist the tricycle operator when filling the questionnaires in order to obtain relevant information's for the study.

Estimation and Discussion on the Contribution of Commercial Tricycle Transportation on revenue generation to the Kaduna State government.

In achieving the specific objective, the binary logistic result was used in analyzing contribution of tricycle transportation on income generation creation in Kaduna State. The estimated result is shown below:

Table 3: Impact of Commercial Tricycle Operators to Revenue Generation to the State Government

Variables(s)			
	Coefficient	z-Statistic	p-value
Tricycle registration fee	1.512413*	4.292689*	0.0019
Daily levy.	1.104444*	3.212947*	0.0013
Fine for traffic offences committed	0.993738*	2.839471*	0.0009
McFadden R-squared	0.756006		
Prob(LR statistic)	0.000000		

Note: *, ** and *** are significant of the coefficient NOTE: *, ** and *** are significant of the coefficient The iteration of log of the logistic model above shows that the model converged quickly after for iteration. Also, with a significant p-value of 0.000000 tells us that our overall model as a whole is fit for prediction. With R^2 0.756006 of shows that the model is explaining the variation of dependent as explained by the independent variables while the remaining percentage are factors outside the model.

The result of the regression above shows that a unit increase in of tricycle registration will bring about 1.5 naira increases in the revenue of the State which is significant with p-value at 1 percent. Also, all the independent variables are statistically significant at 1percent. The implication is that when government wants to boost its revenue from the commercial tricycle transport sector, she can increase the registration fee. It will have impact by the magnitude identify above.

The result also explained that when there is a 1 unit increase on the tax levied on the tricycle operators as a result of movement to another local government will lead 1.1 naira increases in the government revenue which is statistically significant at 5 percent with the p-value of 0.0013. The implication is that, when tricycle rider pay daily tax or levies to the state government. The tax paid has the capacity to increase the state revenue.

Also, a 1 naira increase as a result of offence committed weekly by the operator of tricycle will lead to 0.9 naira increase which is may not be unconnected to the fact that tricycle riders are trying to stop committing offence as a result of the fine imposed by the government of Kaduna state by its security agencies like Kaduna State law enforcement agency and federal road safety in the state.

Summary

The analysis of the logistic model iteration reveals that the model converged quickly after a few iterations. The significant p-value of 0.000000 indicates that the model is a good fit for predicting the dependent variable. The R-squared value of 0.756006 suggests that the model explains approximately 75.6% of the variation in the dependent variable, with the remaining variation attributed to factors outside the model.

The regression results highlight that a 1-unit increase in tricycle registration will result in a 1.5 Naira increase in state revenue, with a 1% p-value, confirming statistical significance. All independent variables are statistically significant at the 1% level. Additionally, a 1-unit increase in tax levied on tricycle operators due to movement to a different local government will lead to a 1.1 Naira increase in revenue, with a 5% p-value. Lastly, a 1 Naira increase in fines imposed on tricycle operators for offenses committed weekly will result in a 0.9 Naira increase in state revenue, which is likely due to deterrence effects of fines.

Conclusion

The results of the regression analysis demonstrate that the model is well-suited for predicting state revenue based on the activities of tricycle operators. The significant p-values and the relatively high R-squared value suggest that the model provides a strong explanation of the relationship between tricycle-related activities (such as registration, tax levies, and fines) and government revenue.

The findings indicate that increases in tricycle registration fees, taxes on movement between local governments, and fines for offenses have a measurable and positive

impact on state revenue. These insights can be leveraged by policymakers to make informed decisions that enhance government revenue from the commercial tricycle transport sector.

Recommendations

1. **Increase in Registration Fees:** Given the statistically significant relationship between tricycle registration fees and state revenue, the government could consider raising the registration fees for tricycles as a means of boosting revenue. However, this should be done cautiously to avoid overwhelming operators.
2. **Adjustment of Tax Levies:** The analysis indicates that taxes imposed on tricycle operators, especially those levied when operators move between local governments, are an important source of revenue. Local governments should explore the potential for introducing or adjusting taxes in a way that is fair and transparent, ensuring that the tax burden does not hinder the growth of the sector.
3. **Enhancement of Fine Systems:** The result showing a relationship between fines for offenses and revenue generation suggests that enforcement of traffic laws and regulations (e.g., through the Kaduna State Law Enforcement Agency and Federal Road Safety Corps) can contribute to increased state revenue. Strengthening enforcement and ensuring that fines are consistently applied could further enhance this revenue stream. Additionally, policymakers should consider public education campaigns to reduce offenses and the need for fines, ultimately improving public compliance and minimizing enforcement costs.
4. **Comprehensive Data Collection and Monitoring:** To further refine the model, the government should ensure continuous data collection on various factors affecting revenue generation, including tricycle registrations, taxes, fines, and external economic factors. Improved data will help in monitoring trends and making timely adjustments to policies.

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Appendix

Impact of Commercial Tricycle Operators on Revenue Generation in the State

Dependent Variable: TAX_AS_INCOME_TO_THE_GOV

Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)

Date: 25/07/2025 Time: 05:00

Sample: 1 203

Included observations: 203

Convergence achieved after 4 iterations

Coefficient covariance computed using observed Hessian

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-1.012313	0.234470	-9.028341	0.0000
OFFENCE_COMMITTED	0.993738	0.349973	2.553579	0.0009
TRICYCLE_REGISTRATION	1.512413	0.352323	5.235232	0.0019
DAILY-LEVY	1.104444	0.343748	3.212947	0.0013
McFadden R-squared	0.756006	Mean dependent var		0.714286
S.D. dependent var	0.662871	S.E. of regression		0.442850
Akaike info criterion	1.181307	Sum squared resid		39.02718
Schwarz criterion	1.246592	Log likelihood		-115.9026
Hannan-Quinn criter.	1.207718	Deviance		231.8053
Restr. Deviance	242.8975	Restr. log likelihood		-121.4487
LR statistic	11.09217	Avg. log likelihood		-0.570949
Prob(LR statistic)	0.000000			
Obs with Dep=0	58	Total obs		203
Obs with Dep=1	145			