

The Effectiveness of the Road Transport System in Nigeria's Tertiary Institution - The Case of the University of Ilorin

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Abstract: As the problems of transporting University of Ilorin, Nigeria students to and from campus are on the increase and it is gradually affecting learning due to limited transportation options. The main objective of this paper is to examine the effectiveness of the road transport system at the University of Ilorin, Nigeria. The study theoretical framework is based on human capital theory. To achieve this objective, questionnaires were distributed to students using a simple sampling technique in choosing respondents from the students' residential areas. And descriptive statistics and multinomial probit regression models were used in analyzing the data collected. The result indicates that there is an inadequate supply of transport modes particularly during peak periods which limited the effectiveness of transportation in the study area. Therefore, recommendations were made so that government, school authorities, and other stakeholders should take measures that will enhance the effectiveness of the transport system. Such measures include transport education, well-structured transport, and lecture timetables to reduce rushing periods, consideration should be given to e-learning and the policy of decreasing the cost of transport and providing adequate transport infrastructure should be implemented. These recommendations if adhered to, will reduce students' stress, and enhance their study capacity, which will in turn, improve human capital development.

Keywords: Human development, Transportation, Transport system, University of Ilorin.

I. INTRODUCTION

The necessity for road transport services in an economy cannot be underestimated, as transport is barely required for its own sake. Rather, it is connected naturally to the survival of the social, political, educational, and economic sectors. Therefore, the transport system entails the choice of transport mode, the cost, and the quality of transportation available to individuals who demand it within a given area and the effective provision of the transport service to fulfill individual's demand. However, the steady increase in demand for an efficient transport system in many developing countries' cities is spurred by population increase and rapid urbanization that coincide with economic growth. As more people populate the urban cities, so is the increase in demand for better living standards, and efficient and faster modes of transportation. Therefore, transportation is regarded as one of the most important foundations of a nation's economy (De, 2005; Ladin *et al.*, 2014). Be it from small towns to large cities, it provides transit for daily mobility between people and their means of livelihood, entertainment, and education (Ahmed *et al.*, 2008). Thus, its accessibility and efficiency define the choice and advanced optimistic conceptualization of public transport services put in place (Aziz and Amin, 2012; Iles, 2005; Shahsavaripour, 2015).

Nevertheless, transportation in most developing countries is characterized by a lack of proper planning and design which creates the problem of effectiveness and sustainability of the transport system (Almselati *et al.*, 2011). Nigeria like other

developing countries has an inefficient transport system, particularly in the cities where higher institutions of learning are located. The factors that contribute to the severity of transportation problems are multifaceted. From the insufficient supply of transport infrastructure and services to over-stretching of the available transport facilities beyond the design capacity and lack of finances to maintain the existing inadequate transport infrastructure. These transportation system problems negatively deterred the advancement of education in higher institutions. Also, it poses a major stumbling block to economic growth and is causing havoc to human resource development in which education is one of the proxies used (Musibau *et al.*, 2019; Pise, 2020; Pucher *et al.*, 2007). Considering the global demand for knowledge transfer, the student enrollment rate in Nigeria's tertiary institutions has greatly increased over the last two decades to enhance and enlarge human capital development; increase total factor productivity; increase equilibrium output, and foster better innovation toward economic growth (Lucas Jr, 1988; Romer, 1990a).

Thus, as students' enrollments increase, so is the decline in motorization level, traffic congestion, awkward parking systems and environmental pollution. This transport system hardship and lack of adequate transport facilities make the delay encountered in transport accessibility tiresome resulting in incessant agitation among students. Furthermore, the significance of transport infrastructure on students' poor academic performance was confirmed in OECD (2011) study carried out. The OECD study indicates a stark contrast in satisfaction levels between students attending schools with good and sufficient infrastructure as compared with those in schools with poor infrastructure, while low scores were attributed to schools that fared badly in these aspects. Considering that educational infrastructure is an important germane to the actualization of human capital development, it is important that transportation (educational infrastructures) must not be handled carelessly and must be ensured. Therefore, the appropriateness of transport infrastructure not just in terms of availability but in their safekeeping should be of utmost importance to actors in the education sector.

On this premise, this paper examines the effectiveness of the transportation system and evaluates the factors preventing its effectiveness in the University of Ilorin, Nigeria and makes recommendations for the concerned stakeholders on the possible way out of the problem. The choice of the University of Ilorin, Nigeria is because the different faculties and departments experience similar transport situation that hinders students' academic performance. Suffice it to say that the university for more than a decade has been facing the limitation of transportation as a major educational facility after the management moved all programmes, except for medical courses, from the mini campus to the permanent site. It is based on this argument that the future productivity of students can be measured based on the quantity of learning they have access to while in school. And the quality of a country's labour force can be judged by the quality of the learning process within the school.

Most importantly, to arrive at an unbiased conclusion, the study uses qualitative data obtained through questionnaires and employs descriptive statistics and probit regression to analyse the data. The probit method of analysis used differs from the existing studies of Abiodun (1998), Oni and Okanlawon (2010) and Oni and Okanlawon (2006) as it accommodates the inclusion of variables that captures the effectiveness and affordability of public transport. Whereas the former descriptive statistics procedures used in analysing transport-related problems overlooked the effectiveness of public transportation. Therefore, apart from this introduction, the rest of the paper is organized as follows. In the second section, the focus is on the relevant literature. The third section is the methodology that includes the transport profile of the University of Ilorin, data, model specification and estimation method. The fourth section contains the results and discussion of findings, while the last section concludes with some recommendations and future direction of the study.

II. LITERATURE REVIEW

The theoretical underpinning of this study is based on the human capital theory as noticeable in the works of Becker (2009), Schultz (1961), Becker (1964), Frank and Bernanke (2007) Fitzsimons (1999), and transportation theory as explained in Mavrotas and Shorrocks (2007) and Njoh (2009). These reviews extensively underscore the importance of education, as ingrained in individuals who constitute the labour force in propelling economic growth, development, and the relationship between transportation and development (De, 2005; Rastogi, 2002). Similarly, the Solow (1956) growth model describes the importance of improving human capital which is usually proxy as the level of education enrollment, health, training, experience, trustworthiness, intelligence, work habits, energy, and initiative that affect the value of a worker's marginal product as the major driver of growth (Frank and Bernanke, 2007; Kwon, 2009; Woodhall, 2001). Therefore, high-quality education is one of the nation's greatest assets, and a long-run profitable investment in human resource development is fundamental to propelling significant economic productivity (Leroy *et al.*, 2012; Romer, 1990b).

Although higher education globally experiences some degree of difficulty in the pursuit of its vision, mission, and goals. Poor transportation has been a major stumbling block that retards progress in higher institutions. The increasing higher institution population is straining the transportation system that makes it up, while funds to maintain and upgrade it has been limited. Considering that transportation systems follow the demand and supply theory like other industries, the complication of the network affects the choices between dissimilar goods (e.g., car and bus travel) making estimating the demand for transportation facilities or infrastructure difficult. Oluwole *et al.* (2017), classified various types of transportation problems including bad roads, high cost, shortage of fuel, traffic congestion, inadequate services, high cost and shortage of spare parts, and poor vehicle maintenance. All these components have rendered

the transportation system in institutions ineffective and thereby resulted in poor academic performance of the students in the university system.

Litman (2010b) and Litman (2010a), proposed that in tackling transportation problems, four major things should be considered. One is growth which involves expanding and doing more. The second is development which is concerned with improving and doing better. The third is mobility, describing physical movement and the fourth is accessible which is obtaining desired goods, services, and activities. Aldrete-Sanchez *et al.* (2010, p. 4) gave their opinion on tackling this problem in "synthesis of best practice" which was categorized into two distinct sections, best practice and lesson learned.

"The best practice section presents a compilation of recommendations from universities across the country for integrating the surrounding transportation system with a university campus master plan. The lesson learned section outlines practical considerations that must be considered when trying to implement best practices on different campuses" (Aldrete-Sanchez *et al.*, 2010, p. 4).

Onakomaiya (1988), asserted that for meaningful and sustainable development in the transport sector, the principle of self-reliance must be translated into concrete action, with appropriate institutional bases laid for areas of research and development. The areas are data collection, storage, and retrieval, utilizing the present local government structure in the country as collection points, to produce socio-economic and traffic flow data for traffic forecasting and projection of future traffic flows. Secondly, identification, testing, and production of spare parts for motor vehicles, water vessels, rail wagons and coaches-culminating in an assembly of locally made spare parts to produce truly *Nigerian Motor Vehicles*. Thirdly, research into traffic management, control, and safety measures including the identification of accident black spots on highways, environmental pollution effects of urban transportation and riverine petroleum transportation. Fourthly, the legal aspects of transportation, including harmonization of road traffic laws and modernization of the highway code by an appropriate national agency and lastly, permanent training in, and enforcement of, maintenance culture in all aspects of transportation.

Transport Education

Research and training in transport education that have not received adequate attention are crucial in achieving optimum solutions to the numerous transportation problems being encountered in Nigerian higher institutions. The existing transport education has been limited to public roads alone, disregarding its efficiency in most schools. This neglect of transport operator's training and retraining scheme, education and indigenous knowledge has constituted a serious bottleneck in the implementation of Nigeria's national transportation development programme which includes that of the higher institution. Thus, a thorough appreciation of transport education becomes an essential tool in effective planning and performance

of road safety management. Although there exists the Nigerian Institute of Transport Technology (NITT), Zaria, charged with middle management staff training; the Maritime Academy of Nigeria, Oron, charged with the training of seafarers and the Nigeria College of Aviation Technology which trains pilots and aircrew workers. Other Nigerian Tertiary Institutions offering transportation studies are Ahmadu Bello University, Zaria, the Federal University of Technology, Owerri (FUTO), Federal University of Technology, Minna, Obafemi Awolowo University, Ile-Ife, University of Benin, University of Calabar, University of Ibadan University of Ilorin, University of Jos, Ladole Akintola University of Technology, Olabisi Onabanjo University, Ago-Iwoye (Ogunjumo, 1993). Others are the University of Lagos, Lagos State University (Oni, 2004) and a few Polytechnics train students in mechanical and civil engineering but none produces technicians for transportation operations Ogunjumo (1993). However, there have been complaints about the paucity of training equipment, research, and funding by these institutions. As skilled manpower depends on overseas training or experts and the available transport facilities do not commensurate with the magnitude of the efforts required to bring the country's dilapidating system into a functioning one (Nigeria National Transport Policy, 2021).

Furthermore, only six out of the universities above have transport management as a major department, considering that transport management has its philosophy as the training of required manpower to allocate and manage national resources in the transport, construction, business, and other infrastructure sectors of the economy. This situation propels Abiodun (1998) and Uzodu (2019) to recommend that educational programmes and research must be relevant to the country's needs. Therefore, "research activities need to be coordinated nationally among all the concerned institutions as well as in partnership with the Polytechnics to optimize research efforts and output" (Abiodun, 1998). From the foregoing, the literature review shows limited documentation on the various integration of transport modes be it bicycle, transit, auto, and pedestrian inside the campus setting. In addition, there is no documentation of the systematic integration of these different modes with the largest transportation system. Therefore, if proper attention is given to traffic education, training and publicity in tertiary institutions, experts produced will see to the transportation problems to guarantee sustainable road safety in the nation.

III. DATA AND METHODS

A. The Study Area: University of Ilorin Transport Profile

University of Ilorin (UNILORIN) has about 3,040 staff and 34,999 students excluding the number of visitors and merchants (UniRank, 2021). The university unlike other federal government-owned universities in Nigeria has experienced an increase in the number of students applying to the institution. This began in the year 2001 when the management decided to ban academic staff from the academic staff union of universities

(ASUU)¹ membership. However, due to the increase in students' carriage capacity, the University stakeholders make provision in the transport system by providing little Marco Polo buses to convey people in and out of the school. For every trip, buses convey about 120 passengers. Also, in a bid to alleviate this transportation problem in UNILORIN, the management of the institution plans to construct a new Motor Park that would be closer to town, so that there would be two drops from the town to the school premises. To complement the efforts of the management and ease the students' transportation hardship, minibuses (Korope) were also provided by the students' union government (SUG), and they also regulate fares to guide the students against exploitation. Unlike the Marco Polo buses, minibuses can only convey 10 passengers per trip. In addition, commercial cab operators are allowed into the university to convey passengers, and recently SimpliMove an intra-city transport service brand has been introduced to ease the transport problem.

However, the geographical location of the University of Ilorin is not encouraged drivers to see the campus as a place of choice. Therefore, a few of the drivers are willing to ply the route. In addition, the size of Tanke road which is a major route to the permanent site of UNILORIN is not helping matters as the road is very small and susceptible to traffic. The accommodation available within the school premises is also inadequate, which resulted in most of the students living off-campus and specifically at Oke-Odo and Tanke. Hence, the whole of Oke-Odo and Tanke is always faced with an uproar of large commuters due to scarce vehicles. As students stay in the queue for a long time daily after the day's lecture, becoming exhausted. This accumulates to result in a decline in the academic performance of students generally.

B. Data

The primary data used in analysing the effectiveness of the transport system in the university system in Nigeria is obtained from a questionnaire distributed to respondents within the study area – university of Ilorin hostels, Oke-Odo, Tanke, Challenge and other students' resident areas. The questionnaire, as expected cut across students from numerous departments and various levels of the school. The sample size is limited to 120 respondents selected from the University of Ilorin, to enable a full and appropriate representation of the sample to make proper generalizations. The selection is based on a simple random sampling technique that would afford all actors within the school premises an equal opportunity of been chosen. The questionnaires were designed to obtain information related to the social background and personal (demographic and socioeconomic) characteristics of the respondents that include age, sex, income, residence, study duration and education level. Also, the respondents' choice of transport mode (COT), the reason for the preferred choice of transport

(RCT), time components (TM, TE, MOC and MFC), quality of the respondents' choice of transport (QCT), ease of transport mode (EASEM and EASEE), change in income (ACT), supplied of transport mode (SPP), and the policy of increasing in transportation for effectiveness (CPCT) are considered. Furthermore, how the choice of transport mode is determined by income, residence, the quality of transport, student level, and cost of transport was analysed.

C. Model Specification and Estimation Method

The theory of demand and supply for transport (Agarwal *et al.*, 2014) in higher institutions provides the conceptual framework for analyzing the problems encountered by an individual in commuting to and from the campus premises. It is assumed that individuals seeking transport services behave economically and rationally (Ladin *et al.*, 2014). Individuals access the risks and the associated expenses before they make decisions to choose a transport mode. Thus, in analysing the transportation problems in higher institutions, factors that affect the choice of transport mode and other variables that seem to pose threat to transportation are considered.

Hence, the simplified effectiveness of the transport system model is as follows:

$$COT = \beta_0 + \beta_1 Y + \beta_2 R + \beta_3 QCT + \beta_4 L + \beta_5 CT + \mu \quad (1)$$

Where, COT = Choice of Transport Mode, Y = Income, R = Residence, QCT = Quality of Transport Mode, L = Level, CT = Cost of Transport and μ is the error term.

Furthermore, in analysing the data for this study, descriptive statistics and a simple multinomial probit regression model are the estimation methods employed. Descriptive statistics - percentage distribution is used to elicit information on the demographic and socioeconomic characteristics of the respondents. While the multinomial probit regression model used in determining the different factors influencing the individual choice of transport mode is following Morikawa (2017) study.

IV. RESULTS AND DISCUSSION

A. Descriptive Statistics

The descriptive analysis for this study as presented in Table I was mainly to reveal the demographic and socio-economic characteristics of the respondents that influence the choice of transport mode (COT) in the study area.

TABLE I: DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS OF THE RESPONDENTS

Factors	Frequency	Percentage
Sex		
Male	62	53.91
Female	53	46.09

¹ASUU's agitation for better staff welfare leads to incessant strike action and closure of the federal-owned universities from academic activities.

Factors	Frequency	Percentage
Age		
Less than 18	15	13.04
19-30	100	86.96
31-40	0	0
Monthly Allowance		
Less than 5000	39	33.91
6000-10000	34	29.56
11000-15000	25	21.73
Above 16000	6	5.21
Residence		
School Hostel	6	5.22
Oke-Odo	30	26.09
Tanke	56	48.70
Challenge	6	5.22
Others	17	14.78
Number of years required		
Four	114	99.13
Five	1	0.87
Present Level		
One	42	36.52
Two	19	16.52
Three	20	17.39
Four	33	28.70
Five	1	0.87

Source: Authors' Computation (2021).

From Table I, the number of male respondents is 62(53.91%) and the number of female respondents is 53(46.09%), making 115 respondents. Male respondents are therefore the major respondents. Also, the age distribution for the respondents below 18 years is just 15, while most of the respondents 100(86.96%) fall into the second category, which is between 19 to 30 years. This is understandable as the average age of students in higher institutions falls within that range. On monthly allowance, most of the respondents' income fall within the range of less than ₦5000, and 6000-10000 Naira. 39(33.91%) respondents fall within this range of less than ₦5000, while 34(29.56%) respondents fall within the range of 6000-10000 Naira. This can be attributed to the fact that most of the students are still dependent on their parents and guardians, and they do not have another income base. 25(21.73%) respondents fall within the range of 11000-15000 Naira and 6(5.21%) respondents get above ₦16000. 11(9.56%) of the respondents refused to fill in their monthly allowance.

The residence is categorized as a school hostel, Oke-Odo, Tanke, Challenge and others. 6(5.22%) respondents are living in the school hostel. The limited bed space available to students can be attributed to the few numbers of respondents. 30(26.09%) respondents live in Oke-Odo, 56(48.70%) live in Tanke and 6(5.22%) live in Challenge. The high number of

respondents' residents can be since students of UNILORIN (the target population) live mostly in these areas. 17(14.78%) respondents live in other areas apart from the ones specified, this shows a great problem in the residential specification. The number of years required for a Course of Study is either four (4) or five (5) for the target sample. 114(99.13%) respondents are required to spend 4 years in the university since most of the courses are 4 years courses. Only 1(0.87%) of the respondent is required to spend 5 years to complete the course of study. On respondents' 'Present Level', 42(36.52%) respondents are in 100 level since they have the highest number of students population. 33(28.70%) respondents are in 400 level, 19(16.52%), (17.39%) and 1(0.87%) respondent is in 200 level, 300 level and 500 level, respectively.

TABLE II: CHARACTERISTICS OF CHOICE OF TRANSPORT BY THE RESPONDENTS

Factors	Frequency	Percentage
COT		
Taxicab	45	39.13
SUG-bus	48	41.74
Marc Polo	17	14.78
Unpainted buses	5	4.35
RCT		
Accessibility	28	24.35
Affordability	46	40.00
Speed	12	10.43
Comfort	29	25.22
TM		
Less than 10 minutes	42	36.52
11-20 minutes	35	30.43
21-30 minutes	15	13.04
31-40 minutes	9	7.83
Above 40 minutes	13	11.30
TE		
Less than 10 minutes	16	13.91
11-20 minutes	26	22.61
21-30 minutes	35	30.43
31-40 minutes	12	10.43
Above 40 minutes	25	21.74
MOC		
Less than 10 minutes	15	13.27
11-20 minutes	52	45.22
21-30 minutes	27	23.48
Above 30 minutes	19	16.52
MFC		
Less than 10 minutes	20	17.39
11-20 minutes	47	40.87
21-30 minutes	23	20.00
Above 30 minutes	23	20.00

Factors	Frequency	Percentage
QCT		
Very poor	2	1.74
Poor	9	7.83
Fair	68	59.13
Good	33	28.70
Very good	3	2.61
EASEM		
Very stressful	18	15.65
Stressful	57	49.57
Easy	34	29.57
Very easy	5	4.35
EASEE		
Very stressful	39	33.91
Stressful	57	49.57
Easy	17	14.78
Very easy	2	1.74
ACT		
Yes	55	47.83
No	60	52.17
SPP		
Yes	112	97.39
No	1	0.87
SPP		
Yes	97	84.35
No	16	13.91
CPCT		
Yes	60	52.17
No	53	46.09

Source: Authors' Computation (2021).

In Table II, the characteristics of the respondents' choice of transport mode are considered. As regards the preferred choice of transport (COT) to and from the University premises, four (4) types of vehicles were specified, they are Taxicab, SUG-bus, Marc Polo, and unpainted buses. 45(39.13%) respondents preferred Taxi to other transport modes available, 48(41.74%) prefer SUG-bus, 17(14.78%) respondents prefer Marc Polo, and 5(4.35%) respondents prefer unpainted buses. The higher number of people preferring the SUG-bus can be attributed to the fact that the SUG-bus only convenes people going to Tanke and most of the students live in Tanke. A few numbers of people preferring unpainted buses could be because these vehicles mostly convey people living far away from the school. The reason for the preferred choice of transport (RCT) is also explained in Table II. Accessibility is responsible for the choice of 28(24.35%) respondents, 46(40.00%) respondents chose affordability for their choice, speed is the reason for 12(10.43%) respondents' choice, and 29(25.22%) respondents chose comfort as the reason for their choice. Affordability which has the highest value for respondents' reason for transport choice can be based on the low allowance for most

respondents since most of the respondents are dependent on their parents and guardians. As regards the minutes spend to get transport mode in the morning (TM), 42(36.52%) respondents claimed that they spend less than 10 minutes getting a transport mode in the morning. 35(30.43%) respondents chose 11-20 minutes, 15(13.04%) respondents, 9(7.83%) respondents, and 13(11.30%) respondents chose 11-20 minutes, 21-30 minutes, 31-40 minutes, and above 40 minutes, respectively. 1(0.87%) respondent however failed to fill this in the questionnaire. Based on these results, a conclusion can be made that it is easy to get a transport mode in the morning since 36.53% and 30.43% of respondents can get a transport mode within 20 minutes.

On getting a transport mode in the evening (TE), 16(13.91%) respondents claim to spend less than 10 minutes getting a transport mode. 26(22.61%) respondents, 35(30.43%) respondents, 12(10.43%) respondents, and 25(21.74%) respondents all chose 11-20 minutes, 21-30 minutes, 31-40 minutes and above 40 minutes, respectively. Therefore, a conclusion can be made that the respondents spend lesser minutes getting a transport mode in the morning than in the evening. On the quality of the respondents' preferred choice of transport (QCT), 68(59.13%) respondents chose fair, 2(1.74%) respondents, 9(7.83%) respondents, 33(28.13%) respondents, and 3(2.61%) respondents chose very poor, poor, good, and very good respectively. This shows that the quality of most transport modes is fair enough as more than half of the respondents attest to it. As regards EASEM, that is, how easy it is to get a transport mode in the morning. More than 49% of respondents agreed that it is stressful to get a transport mode in the morning, and 18(15.65%) respondents claim that it is very stressful to get a transport mode in the morning. 34(29.57%) and 5(4.35%) respondents chose easy and very easy, respectively. In the evening EASEE, 57(49.57%) respondents agreed that it is stressful to get a transport mode, 39(33.91%) respondents went for stressful, 17(14.78%) respondents chose easy, while 2(1.74%) respondents chose very easy. From both EASEM and EASEE analysis, a conclusion can be drawn that it is easier to get a transport mode in the morning than in the evening. Furthermore, 55(47.83%) respondents are of the view that a change in their income will cause a shift in their choice of transport mode. While 60(52.17%) respondents stated that they would maintain their current choice of transport mode irrespective of the change in income. That is, a change in income will not affect their choice of transport mode. Moreover, out of the 115 respondents, 112(97.39%) respondents agreed that the transport mode is inadequately supplied during peak periods, and only 1(0.87%) respondent disagreed with this notion. Lack of coordination on the part of the students during peak periods has also been a major problem militating against an effective transport system in UNILORIN as 97(84.35%) respondents attest to this. While 16(13.91%) respondents disagreed with the notion. Lastly, in curbing the problem of transportation in UNILORIN the policy of increasing the transport fare and increasing the availability of different transport modes was suggested, 60(52.17%) respondents supported this policy, while 53(46.09%) respondents disagreed with the policy.

B. Presentation and Interpretation of the Regression Results

The multinomial probit regression analysis is based on the adequately filled questionnaire for 115 respondents out of the total distributed questionnaire of 120 copies to respondents in the study area. This shows that there is a 96% response rate, and the high rate is associated with the fact that the respondents are students. Based on the main objective of this study, the multinomial probit regression results in Table 3 are interpreted by the sign of the coefficient obtained. The Wald $\chi^2(15)$ used in testing for the significance of the model is 27.92% and the $\text{prob} > \chi^2 = 0.0221$. Thus, it is imperative to mention that the significance or otherwise of the dependent and explanatory variables will be tested with the use of the probability value (*p-value*) obtained from the regression results. More importantly, the result of the multinomial regression is explained based on Marc polo (School bus) which is the base outcome.

TABLE III: MULTINOMIAL PROBIT REGRESSION RESULTS

Sr. No.		COT	Coefficient	P> Z
1.	Taxicab	Income	0.000*(0.00)	0.057
		Residence	-0.606*(0.34)	0.076
		QCT	1.156**(0.54)	0.033
		Level	0.697**(0.36)	0.051
		CT	0.040*** (0.01)	0.003
		CONS	-5.089**(2.22)	0.022
2.	SUG-bus (Korope)	Income	0.000(0.00)	0.208
		Residence	-0.518(0.33)	0.121
		QCT	1.270**(0.55)	0.020
		Level	0.758**(0.35)	0.032
		CT	0.031** (0.01)	0.018
		CONS	-4.865**(2.19)	0.027
3.	Marc Polo (School bus)	Base Outcome		
4.	Unpainted buses	Income	0.000**(0.00)	0.038
		Residence	-0.149(0.49)	0.763
		QCT	1.157(0.79)	0.143
		Level	0.443(0.44)	0.315
		CT	0.030*(0.02)	0.069
		CONS	-7.518**(2.96)	0.011
Number of observations				104
Log-likelihood				87.970403
Wald $\chi^2(15)$				27.92
Prob > χ^2				0.0221

Note: All estimates are carried out using STATA 12.0 software. The coefficients and the p-values for all variables are given in parentheses. *, ** and *** denotes significance at 10%, 5% and 1% respectively.

Therefore, as shown in Table III, the sign of the coefficient of Income is significant at 5% and 10% significant levels but it is not significant 1% significant level. The cost of transport mode is significant at 1%, 5% and 10% levels for all the types of vehicles available. The first choice of transport mode is Taxicab, and the first explanatory variable is Income, which is positive and significant, and this implies that an increase in income increases the probability of choosing Taxicab over Marc Polo. The residence is the second explanatory variable, and it has a negative sign which implies that the closer the place a student stays in the school, the lower the probability of a student choosing Taxicab over Marc Polo. QCT (Quality of Transport mode) is another explanatory variable, and it has a positive sign, which implies that the higher the quality of a transport mode, the higher the probability of a UNILORIN student choosing Taxicab over Marc Polo. Furthermore, as regards the student's level, the higher the level of a student, the higher the probability of a student choosing Taxicab over Marc Polo, as the coefficient of "Level" is positive and significant. Also, according to the regression results, the higher the cost of a transport mode, the higher the probability of choosing Taxicab over Marc Polo.

In explaining the significance of the results further, the signs of the coefficient of Income and Residence are significant at 10% and 5% levels for both Taxicab and unpainted buses. In respect of the quality of a transport mode, the result of the explanatory variable is significant at 5% for Taxicab and SUG-bus. And CT (Cost of transport) has a positive sign, and it is significant at 1%, 5%, and 10% for all vehicles available. For the second choice of transport (SUG-bus Korope), an increase in the level of a student's income leads to an increase in the probability of such student preferring SUG-bus to Marc Polo. The closer to the place a student lives in the school, the lower the probability of the student preferring the SUG-bus to Marc Polo. The sign of the coefficient of income and residence is also not significant at the 1%, 5%, and 10% significance levels. On the other hand, an increase in the quality of a transport mode increases the probability of a student preferring the SUG-bus to Marc Polo. The sign of the coefficient of "Level" in this second choice of transport mode is positive. Therefore, the higher the level of a student, the higher the probability of preferring SUG-bus to Marc Polo. In addition, an increase in the cost of transport also increases the probability of preferring the SUG-bus to Marc Polo. Results of Quality of transport mode, Level, and Cost of Transport are positively significant at a 5% level. As for the fourth choice of transport, only income and cost of transport mode are significant at 5% and 10% respectively. Although, Income, Quality of transport mode, Level and Cost all had a coefficient with a positive sign which implies that an increase in any of these variables will lead to an increase in the probability of a student preferring unpainted buses to Marc Polo. The coefficient of residence is not significant but has a negative sign which implies that the closer the place a student lives in the school, the lower the probability of a student preferring unpainted buses to Marc Polo.

V. CONCLUSION AND RECOMMENDATIONS

The role of transportation cannot be overruled in achieving effective learning in higher institutions. This fact influences the choice of this study, it unfolds how effective the transport system is, as regards students' choice of available transport mode at the University of Ilorin, Nigeria. From the descriptive and inferential statistical analysis results, there is an inadequate supply of transport modes during peak periods which limited the effectiveness of transportation in the study area. Therefore, for an effective learning environment, the University stakeholders should ensure that there is transportation effectiveness by providing different transport modes during peak periods even if it requires an increase in the cost of the transport mode available. More importantly, adequate transport education should be given to the transport officials of different institutions, to ensure their ability to coordinate students properly during peak periods and solve traffic congestion, and other problems associated with campus transport before it becomes an incurable issue. This is necessary, considering that very few institutions take transportation as a major course. Other recommendations include the provision of a well-structured car park by the school authority and security personnel to be made available to curb students' misbehaviour during peak periods. Also, the timetable should be structured in such a way that lectures would be spread throughout the week to avoid rushing periods. Online lectures (E-learning) should be considered and made effective to reduce the tension in the transport system. Consequentially, an important step for further research is necessary for other universities in Nigeria because this study is limited to the University of Ilorin, Nigeria. While different universities have their transport mode and issues that are peculiar to them. Therefore, the inferences drawn from this study may not be true for the whole population, thus, generalizations cannot be acclaimed perfect.

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REFERENCES

- [1] A. A. Abiodun, "Human and Institutional capacity building and utilization in science and technology in Africa: An appraisal of Africa's performance to-date and the way forward," *African Development Review*, vol. 10, no. 1, pp. 10-51, 1998.
- [2] O. Agarwal, G. Padam, and C. Ibraimova, "Formulating an urban transport policy: Choosing between options," 2014. Accessed: Jul. 10, 2019. [Online]. Available: <https://openknowledge.worldbank.org/handle/10986/20950>
- [3] Q. I. Ahmed, H. Lu, and S. Ye, "Urban transportation and equity: A case study of Beijing and Karachi," *Transportation Research Part A: Policy and Practice*, vol. 42, no. 1, pp. 125-139, 2008.
- [4] R. Aldrete-Sanchez, J. Shelton, and R. L. Cheu, "Integrating the transportation system with a university campus transportation master plan: A case study," 2010. [Online]. Available: <https://static.tti.tamu.edu/tti.tamu.edu/documents/0-6608-3.pdf>
- [5] A. S. I. Almselati, R. Rahmat, and O. Jaafar, "An overview of urban transport in Malaysia," *Social Sci*, vol. 6, no. 1, pp. 24-33, 2011.
- [6] A. Aziz, and N. F. M. Amin, "Transforming the land public transport system in Malaysia," *Sharing Urban Transport Solutions*, vol. 30, 2012.
- [7] G. Becker, "Human capital - A theoretical and empirical analysis, with special reference to education," National Bureau of Economic Research, General Series, No. 80. New York and London, *Series*, vol. 16, no. 80, p. 187, 1964.
- [8] G. S. Becker, *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. University of Chicago Press, 2009.
- [9] P. De, "Cooperation in the regional transportation infrastructure sector in South Asia," *Contemporary South Asia*, vol. 14, no. 3, pp. 267-287, 2005.
- [10] P. Fitzsimons, "Human capital theory and education," *Encyclopedia of Philosophy of Education*, pp. 1-5, 1999.
- [11] R. H. Frank, and B. S. Bernanke, *Principles of Microeconomics*, 3rd ed. McGraw-Hill/Irwin, 2007.
- [12] R. Iles, *Public Transport in Developing Countries*. Amsterdam: Elsevier, 2005, vol. 478.
- [13] D.-B. Kwon, "Human capital and its measurement," In *The 3rd OECD World Forum on "Statistics, Knowledge and Policy" Charting Progress, Building Visions, Improving Life*, 2009.
- [14] M. A. Ladin, A. M. Das, A. Najah, A. Ismail, and R. A. A. O. Rahmat, "A review of strategies to implement sustainable urban transportation options in Malaysia," *Jurnal Teknologi*, vol. 69, no. 2, 2014.
- [15] J. L. Leroy, P. Gadsden, and M. Guijarro, "The impact of daycare programmes on child health, nutrition and development in developing countries: A systematic review," *Journal of Development Effectiveness*, vol. 4, no. 3, pp. 472-496, 2012.
- [16] T. Litman, *Evaluating Public Transit Benefits and Costs: Best Practices Guidebook*, 2010a.
- [17] T. Litman, "Quantifying the benefits of non-motorized transportation for achieving mobility management objectives," Victoria Transport Policy Institute, Canada,

- 2010b.
- [18] R. E. Lucas Jr, "On the mechanics of economic development," *Journal of Monetary Economics*, vol. 22, no. 1, pp. 3-42, 1988.
- [19] G. Mavrotas, and A. Shorrocks, *Advancing Development*. Springer, 2007.
- [20] M. Morikawa, "Firms' expectations about the impact of AI and robotics: Evidence from a survey," *Economic Inquiry*, vol. 55, no. 2, pp. 1054-1063, 2017.
- [21] H. O. Musibau, A. H. Yusuf, and K. L. Gold, "Endogenous specification of foreign capital inflows, human capital development and economic growth: A study of pool mean group," *International Journal of Social Economics*, vol. 46, no. 3, pp. 454-472, 2019. [Online]. Available: <https://doi.org/http://dx.doi.org/10.1108/IJSE-04-2018-0168>
- [22] A. J. Njoh, "The development theory of transportation infrastructure examined in the context of Central and West Africa," *The Review of Black Political Economy*, vol. 36, no. 3-4, pp. 227-243, 2009.
- [23] OECD, "Effective learning environments (ELE)," 2011. Accessed: Jul. 29, 2021. [Online]. Available: <https://www.oecd.org/education/effective-learning-environments/>
- [24] A. Ogunjumo, *Training Needs for Mass Transit Operators in Nigeria*. Heinemann Educational Book, 1993.
- [25] M. Oluwole, J. Ojekunle, D. Masugari, A. Usman, M. Dalil, and M. Abdullahi, "Quality of road transport infrastructure in minna metropolis, Nigeria," *Zaria Geographer*, vol. 24, no. 1, pp. 164-178, 2017. [Online]. Available: <https://geography.abu.edu.ng/journal/2017/files/14.pdf>
- [26] S. O. Onakomaiya, "Unsafe at any speed: Toward road transportation for survival," *Inaugural Lecture*, University of Ilorin, Ilorin, 1988.
- [27] S. Oni, and K. Okanlawon, "Nigeria's transport infrastructural development: An integral part of the national economic empowerment and development strategy (NEEDS)," *Journal of Social and Policy Issues*, vol. 3, no. 2, pp. 7-13, 2006.
- [28] S. Oni, and K. Okanlawon, "Transportation education in Nigeria," *Exploring the Multifaceted Dimensions in Exercise and Sports Psychology*. Ibadan: Nigeria, Olu-Akin Publishers, 2010, pp. 106-118.
- [29] S. I. Oni, "Urbanization and transport development in metropolitan Lagos," In A. M. O. A. (Ed.), *Industrilisation, Urbanization and Development in Nigeria 1950-1999*. Lagos: Concept Publication Limited, 2004.
- [30] P. V. Pise, "A study of quality services provided by MSRTC with special reference to Pune division," *Bulletin Monumental*, vol. 21, no. 7, pp. 82-118, 2020. [Online]. Available: <http://bulletinmonumental.com/gallery/13-july2020.pdf>
- [31] N. N. T. Policy, "The economic sustaility of transportation and national development vehicular emissions national action plan for health security national transport policy and cities," *Transport*, Jan. 25, 2021. [Online]. Available: <https://www.peregene.com/nigeria-national-transportation-policy/>
- [32] J. Pucher, Z. Peng, N. Mittal, Y. Zhu, and N. Korattyswaroopam, "Urban transport trends and policies in China and India: Impacts of rapid economic growth," *Transport Reviews*, vol. 27, no. 4, pp. 379-410, 2007.
- [33] R. Rastogi, "A policy sensitive behavioural model of transit access," 2002, Unpublished PhD. Thesis.
- [34] P. M. Romer, "Capital, labor, and productivity," *Brookings Papers on Economic Activity: Microeconomics*, pp. 337-367, 1990a.
- [35] P. M. Romer, "Endogenous technological change," *Journal of Political Economy*, vol. 98, no. 5(Part 2), pp. S71-S102, 1990b.
- [36] T. W. Schultz, "Investment in human capital," *The American Economic Review*, vol. 51, no. 1, pp. 1-17, 1961.
- [37] S. Shahsavaripour, "Different methods of redistributing bike among the station: A mathematical solution in order to find critical stations," *American Journal of Environmental Engineering*, vol. 5, no. 1, pp. 21-31, 2015.
- [38] R. M. Solow, "A contribution to the theory of economic growth," *The Quarterly Journal of Economics*, vol. 70, no. 1, pp. 65-94, 1956.
- [39] UniRank, "UniRank World University rankings & reviews," University of Ilorin, 2021. Accessed: Jul. 23, 2021. [Online]. Availabe: <https://www.4icu.org/reviews/7222.htm>
- [40] C. C. Uzondu, "The influence of road safety culture on driver behaviour: A study of Nigerian drivers," University of Leeds, 2019.
- [41] M. Woodhall, "Financing higher education: The potential contribution of fees and student loans," *International Higher Education*, vol. 22, no. 8, pp. 223-228, 2001.

APPENDIX I

Research Questionnaire

Section A: Socio-Economic Background [Personal

Characteristics]

Please answer the questions under this section by filling in the gaps where necessary/needed or by ticking the appropriate/correct option.

1. Gender:
(a) Male [] (b) Female []
2. Age:
(a) 0-18 [] (b) 19-30 [] (c) 31-40 []
3. Monthly Income/allowance (#):
(a) 0-5000 [] (b) 6000-10,000 []
(c) 11,000-15,000 [] (d) Others please specify ____
4. Your residence:
(a) School hostel [] (b) Oke-odo [] (c) Tanke []
(d) Challenge [] (e) Other please specify ____
5. Number of years required for your course of study
6. Present Level

Section B

7. Which transportation mode of the University of Ilorin do you prefer?
(a) Taxicab [] (b) SUG-bus []
(c) Marc Polo [] (d) Unpainted buses []
8. Why do you prefer your choice of transportation mode?
(a) Accessibility [] (b) Affordability []
(c) Speed [] (d) Comfort []
9. How many minutes does it take you to wait for a transport mode in the morning at the bus stop?
(a) 0-10 minutes [] (b) 11-20 minutes []
(c) 21-30 minutes [] (d) 31-40 minutes []
(e) Above 40 minutes []
10. How many minutes does it take you to wait for a transport mode in the evening?
(a) 0-10 minutes [] (b) 11-20 minutes []
(c) 21-30 minutes [] (d) 31-40 minutes []
(e) Above 40 minutes []
11. What is the cost of your preferred choice of transport mode?
(a) 20 [] (b) 50 [] (c) 70 []
(d) 100 [] (e) Other please specify
12. How many minutes does it take you to arrive at the university premises from off-campus?
(a) 0-10 minutes [] (b) 11-20 minutes []
(c) 21-30 minutes [] (d) Above 30 minutes []
13. How many minutes does it take you to arrive at your desired destination from the university premises?
(a) 0-10 minutes [] (b) 11-20 minutes []
(c) 21-30 minutes [] (d) Above 30 minutes []
14. How is the quality of service of your choice of transport mode?
(a) Very good [] (b) Good [] (c) Fair []
(d) Poor [] (e) Very poor []
15. How easy is it to get a transport mode when you arrive at the bus stop in the morning?
(a) Very easy [] (b) Easy [] (c) Stressful []
(d) Very stressful []
16. How easy is it for you to get a transport mode when you arrive at the bus stop in the evening?
(a) Very easy [] (b) Easy [] (c) Stressful []
(d) Very stressful []
17. Will a change in your income shift your preference to an alternative transport mode?
Yes [] (b) No []

Section C

18. Inadequate transport supply during peak periods is a major challenge faced while trying to board a mode of transport?
(a) Yes [] (b) No []
19. Lack of coordination on the part of students during peak periods is a challenge faced while trying to board a mode of transport?
(a) Yes [] (b) No []
20. Assuming there is an increase in the fare being charged for a guaranteed reduction in the waiting time for a mode of transport. Will this policy change your preferred choice of transport mode?
(a) Yes [] (b) No []

Thanks for your prompt and accurate answers.