

# Beyond Infrastructure Rehabilitation: Socioeconomic Determinants of Intercity Passenger Choice on Nigeria's Narrow-Gauge Railway Service

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**Abstract** The success of transport infrastructure development now transcends the traditional metrics of project completion and passenger volume. Contemporary transport discourse now emphasises the extent of infrastructure systems promoting a socially inclusive, equitable mobility that provides a broad-based accessibility across socioeconomic groups. Consequently, the effectiveness of Nigeria's rehabilitated narrow gauge railway infrastructure must look beyond operational performance and economic returns, but by the degree to which the service is responsive to the mobility needs of diverse social groups in the country. This study examines the socioeconomic determinants of intercity passenger choice on Nigeria's rehabilitated narrow-gauge railway system. Data emanated from a survey of 1071 respondents travelling along the Western Line between Lagos and Kano. The study investigates using Binary Logistic Regression how gender, marital status, income, age, education, occupation, household size, and vehicle ownership influence the probability of passengers choosing travel by Nigeria's narrow-gauge railway over road transport. Results show three socioeconomic variables emerged as statistically significant predictors: female passengers were approximately three times more likely than males to use rail; married respondents were substantially less likely than single respondents to choose rail; and higher income was associated with increased likelihood of rail use. Age, education, occupation, household size, and vehicle ownership were not significant predictors. The findings indicate that socioeconomic characteristics play a selective rather than universal role in shaping narrow-gauge rail demand. While the study notes the relative attraction of choice riders, the study recommends continuous improvement of fixed and rolling stock to full attraction of passengers across socioeconomic groups.

**Keywords** Passenger Socioeconomic Influence, Modal Choice, Railway Travel, Narrow Gauge, Intercity Travel

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## 1. Introduction

Road transport in Nigeria has in the last four and half decades dominated intercity travel in Nigeria [11]. Although the rail mode occupied this central position in the country's long-distance passenger mobility architecture, its relevance declined steadily due to prolonged institutional neglect, weak policy commitment, managerial inefficiency, and chronic capital underinvestment that eroded its operational capacity and service competitiveness with the road mode [25]. Consequently, the road mode has sustained its dominance, accounting for more than 95% of all movement in the country [13]. This heavy structural imbalance in Nigeria's land transport system comes with significant implications for transport system sustainability as road travel exhibits frequent congestion, rapid deterioration, travel cost escalation, and modal vulnerability.

Nigeria's 25-year railway development plan, initiated in 2002, was designed to redress the challenges associated

with the observed modal imbalance. This three-phased initiative is to reposition rail transport as a viable alternative to road transport [10]. The first phase prioritised the rehabilitation of Nigeria's existing narrow-gauge network due to its extensive territorial penetration, inherited right-of-way, immediate deployability. This strategic policy framework, as part of its first phase, contentiously conceived the old gauge not as an obsolete legacy infrastructure, but as a transitional asset capable of facilitating intercity passenger distribution, enhancing regional accessibility, and a socially affordable long-distance movement [11]. Twenty-three years into the implementation of the plan, progress has barely moved beyond the first phase [25]. The revamped narrow-gauge network remains the dominant rail infrastructure in the country, constituting about 84% of available operational track. However, railway authorities have labeled the first phase as being successful due to the significant passenger patronage it has attracted [10].

Contemporary transport policy scholarships now argue that the strategic success of public transport interventions

should be further evaluated beyond the physical restoration of infrastructure or aggregate ridership increase [6]. This new viewpoint now evaluates the extent to which mobility opportunities cuts across socially differentiated user groups as equally important [28]. Such evaluation of success and impacts of transport intervention projects must look beyond volume of attracted patronage and captive travellers [6] but must now evaluate social inclusion as metric of equality [25].

By comparison, railway systems of developed countries of the Global North are well documented as being socially inclusive services, attracting broader socioeconomic riders [8]. Conversely, African railway services, including that of Nigeria, have for many decades exhibited a social image of a low status and low-fare mode patronized by low-income travelers [5]. More worrisome in Nigeria's instance, is the fact that the revitalised narrow-gauge service yet continues to operate under significant technical and market constraints reminiscent of the previous moribund service. Studies have reported problems such as slow speed, prolonged journey duration, delays, breakdowns, mixed usage of new and aging rolling stock and shortage of locomotives [1]. These limitations are known to negatively affect passenger experience and limit the attractiveness of the service. However, the surge in passenger traffic reported since the reopening of the narrow-gauge service in Nigeria introduces an important empirical uncertainty as to the larger impact of the rehabilitation. Indeed, it begs the question if and how the revitalised narrow-gauge service has been able to attract a broad cross-section of Nigeria's socio-economic groups or whether the reported surge in ridership is a mere reflection of the continued dependence of captive users on the cheapest available intercity mode. Answering this question will clarify if the reported passenger surge should be interpreted as conclusive evidence of strategic railway recovery or not.

Available academic literature in the period after rehabilitation and resumption of railway service in Nigeria, such as [29], [11], [16], [13], [26], [32], [34], has largely focused on the infrastructural rehabilitation, institutional performance, macroeconomic significance, and operational sustainability of rail transport. While these studies have substantially improved the understanding of the operational, technical and policy dimensions of railway revitalisation in Nigeria, they have provided very limited explanation of our understanding of the social response to the restored passenger services.

Without this evidence, policymakers may lack a firm analytical basis to justify if the mode is generating a broad equitable transportation benefit across passenger classes or merely reactivating a historically residual service for lower-income travellers. Resolving such uncertainty will improve informed decision-making on future railway investment priorities, fare policy, service differentiation, passenger market expansion [6]. Considering the foregoing, this study socioeconomic determinants of intercity passenger choice on the rehabilitated narrow-gauge operation in Nigeria.

## 2. Literature Review

### 2.1. Conceptual Framework

From a transport policy standpoint, railway revitalisation achieves strategic relevance only when renewed infrastructure produces not merely operational continuity but measurable behavioural recapture across socially differentiated passenger groups. In other words, infrastructure recommissioning does not necessarily mean passenger market recovery, and passenger market recovery does not automatically imply socially inclusive modal competitiveness. This framework shows where restored services remain attractive only to low-income or transport-captive users, state investment may satisfy limited welfare mobility obligations without accomplishing the broader objectives of transport diversification, revenue resilience, and substantive reduction in road dependence. The socioeconomic structure of patronage therefore becomes a critical evaluative lens for determining whether Nigeria's narrow-gauge rehabilitation represents genuine modal recovery or simply the persistence of residual rail dependency.

### 2.2. Theoretical Framework

This study is anchored in three theoretical perspectives: Random Utility Theory (RUT), the Transport Captivity–Choice Framework, and Transport Equity Theory. Together, these frameworks provide a robust theoretical basis for understanding why passengers with different socioeconomic profiles make different modal choices, and what those choices reveal about the social performance of Nigeria's rehabilitated narrow-gauge railway system.

#### 2.2.1. Random Utility Theory

The foundational theoretical basis for this study is the Random Utility Theory (RUT). Originally formalised by McFadden [22] and subsequently extended through discrete choice modelling. RUT posits that rational individuals, when confronted with a finite set of transport alternatives select the option that maximises their perceived utility. Utility in this context is understood as a combined effect of the observable attributes of each mode. These include travel time, cost, comfort, and reliability, alongside the unobservable preferences of the individual traveller. Because a portion of the utility function remains unobservable to the researcher, the model is expressed probabilistically: the probability that an individual selects a given mode is a function of the relative utilities of all available alternatives. Non uniformity in utility perception is a heterogeneity perception useful in binary logistic regression modelling through estimated odds ratios associated with each socioeconomic predictor. The utility of the rehabilitated narrow gauge railway service versus the utility of intercity road travel determines the mode choice taken by passengers, The utility derived by the different socio-economic then determines choice of travel.

### 2.2.2. Transport Captivity–Choice Framework

A second theoretical strand informing this study is the distinction between captive and choice transit riders, a conceptual framework that has significant implications for evaluating the social performance of public transport systems. As Guerra [17] and [4] established, choice riders are passengers who have access to multiple transport options, including private vehicles, but deliberately select public transport for specific trips. Captive riders, by contrast, are those whose modal choice is constrained by limited financial resources, lack of vehicle access, or the absence of viable alternatives.

This framework is directly relevant to the Nigerian narrow-gauge context. If current railway patronage is dominated by captive riders, that is, passengers who use rail not because it maximises their utility but because it provides the cheapest means of travel relative to road transport. This implies if these passengers are classified as financially inaccessible or impractical, then the surge in ridership documented after rehabilitation may reflect residual dependency rather than genuine modal recovery. Conversely, if higher-income passengers and those with vehicle access are also choosing rail, this would suggest that the service has developed sufficient attributes to compete on utility grounds with road transport.

The central empirical question this study addresses is whether the rehabilitation programme has been sufficiently transformative to also attract choice riders, passengers who could access road alternatives but perceive rail as offering superior utility for intercity travel.

### 2.2.3. Transport Equity Theory

The third theoretical pillar of this study rests on the Transport Equity Theory, which evaluates mobility systems not only on efficiency or aggregate ridership metrics but on the distribution of mobility opportunities across social groups. Transport equity scholarship, represented by foundational works from [20] and [21] among other recent contributions, argues that public transport systems should be assessed by the extent to which they provide socially inclusive access to mobility across income classes, genders, occupational groups, and household types.

A transport system that serves only the poorest or most mobility-constrained segments of the population, however efficiently, is failing its equity mandate because it reinforces rather than reduces social stratification. When a mode becomes associated exclusively with disadvantaged or captive users, it enters a pattern of declining social status, reduced commercial viability, and diminished political support for sustained investments. This is dynamic well documented in transport social exclusion literature [20]; [21]. This cycle is synonymous with the previous moribund service of Nigeria Railway Corporation (NRC) that led to government intervention policy. Failure of the rehabilitated NRC services to reach beyond captive, operators will likely lose social prestige, commercial viability, and the political support needed to attract sustained investment. The theory posits

such residual transport systems tend to become trapped in a cycle of underinvestment, declining service quality, and further concentration of disadvantaged users.

## 2.3. Empirical Review

A review of literature from both developed and developing economies reveals important variations in the socioeconomic dynamics of railway patronage and modal choice behaviour. In developed economies of the Global North, scholarly attention has increasingly shifted from purely infrastructural and operational concerns toward broader behavioural and socioeconomic explanations of rail use. This transition reflects a growing recognition that passenger decisions are influenced not only by transport supply characteristics such as speed, accessibility, and punctuality, but also by social status, environmental consciousness, travel attitudes, and perceptions of service quality. Consequently, contemporary railway studies increasingly adopt integrated behavioral frameworks that combine economic, psychological, and sociological determinants of travel behaviour.

Within this context, income has consistently emerged as a major determinant of rail patronage among these countries. For example, [17] found significant variation in rail preferences across income groups, with higher-income passengers who have access to private vehicles, demonstrating a greater willingness to use rail services when service quality improves, while lower-income captive riders use transit regardless of service conditions. Similarly, [4], analyzed railway passengers in Great Britain and found that passenger segments differ significantly in what drives their satisfaction, with more demanding segments placing the greatest emphasis on seat comfort and train upkeep, while price sensitivity characterised less satisfied groups, suggesting that economically advantaged passengers prioritise service quality and travel experience over ticket cost. These findings suggest that service quality enhancement is central to attracting and retaining middle and high-income rail users who possess alternative mobility options.

Other recent scholarship have refined the existing traditional captive–choice rider dichotomy by identifying a third category referred to as “captive-by-choice” passengers. The work of [33] described these riders as individuals without private automobiles who nevertheless prefer public transport because of environmental values, urban lifestyles, or positive service perceptions. Extending this perspective, [24] and [8], both using post-pandemic data from Montreal, demonstrated that the proportions of captive, choice, and captive-by-choice riders have shifted considerably, and that mode satisfaction varies significantly across these groups in response to changing socioeconomic conditions and service quality. These findings underscore the dynamic nature of transport behavior and highlight the importance of empirically examining the socioeconomic composition of rail ridership rather than assuming homogeneous patronage patterns.

There are however other important socioeconomic elements identified among these countries. These variables include occupation, trip purpose, education, and automobile ownership all of which have been shown to significantly

influence rail travel behaviour. [23], analysing over 32,000 rail passenger survey responses in Great Britain, demonstrated that punctuality ranked as a significantly more important service attribute for business travellers than for leisure passengers, who placed comparatively greater weight on cost-related considerations in their travel decisions. Likewise, [30] found that highly educated passengers exhibit stronger pro-rail attitudes and greater modal loyalty. In addition, [31] found that income, job status, and transportation subsidies increase the likelihood of owning a car and driving to work, indicating that private automobile ownership reduces dependence on rail, with decisions influenced by money, time, comfort, and safety considerations, although worsening congestion and environmental concerns continue to strengthen rail competitiveness.

In contrast to the developed countries, literature from developing countries, particularly within Africa and Nigeria, remains heavily dominated by concerns relating to infrastructural deficits, operational inefficiency, affordability constraints, and service unreliability. Unlike developed economies where rail increasingly competes for discretionary riders, railway systems in many African countries continue to perform welfare and mobility support functions for economically constrained populations. Consequently, scholarly attention has focused more on infrastructure rehabilitation and operational sustainability than on behavioural dimensions of passenger choice and transport equity.

[27] examined the geometric growth and historical performance trajectory of railway transportation in Nigeria between 1970 and 2016, identifying institutional and operational constraints affecting railway development. Similarly, [27] demonstrated significant relationships between railway transport development and land-use dynamics in Nigeria, emphasizing the spatial implications of rail revitalization efforts. [18] and [2] demonstrated that affordability, accessibility, income, and educational attainment significantly influence transport preferences among Nigerian travellers. [13] explored macro-economic influence on railway ridership in Nigeria noting railway patronage as parsimonious. [1] explored socioeconomic factors of commuter railway ridership in Lagos, Nigeria, without looking into factors on the intercity path. These studies focused predominantly on urban transport systems rather than intercity rail services. Furthermore, studies on railway revitalization and infrastructure performance have paid limited attention to the behavioural determinants of rail patronage despite increasing investment in railway modernization programmes.

Consequently, there remains insufficient empirical evidence regarding how contemporary railway reforms and rehabilitation programmes are reshaping the socioeconomic profile of rail users within Nigeria's emerging conventional railway systems. Existing scholarship remains heavily concentrated on high-speed rail and urban transit systems in developed economies, with comparatively limited attention devoted to rehabilitated narrow-gauge corridors in developing countries. Without a clear understanding of the socioeconomic determinants of passenger modal choice, transport planning decisions relating to fare structures, ser-

vice differentiation, customer segmentation, and future railway investments may continue to proceed without adequate demand-side intelligence.

### 3. Methods

A survey research design was adopted for the study. Primary data was collected through a structured questionnaire randomly administered to 1,071 passengers traveling on the 1,132km Western Line of NRC from Lagos, Nigeria's chief commercial and industrial city in the southwest of the country, and Kano in North Central. The line was chosen because it remains the most operationally active within the network, traversing 7 states along its path. The Line, therefore, should serve a diverse socioeconomic group across multiple geopolitical zones, making it an appropriate setting for examining the socioeconomic determinants of intercity rail modal choice.

Given that the dependent variable is dichotomous, the binary logistic regression was selected as the appropriate analytical technique. The model can measure the probability of an individual belonging to one of two outcome categories being a rail or road user as a function of a set of socioeconomic predictor variables used in the study.

The dependent variable is coded as 1 for passengers who primarily use the narrow-gauge railway service and 0 for those who use road transport as their primary intercity mode. Eight socioeconomic characteristics of respondents were entered as independent variables: gender (SEX), marital status (MARIT; reference category: single), occupation (OCCUP; reference category: student), monthly income (INCOME), age (AGE), educational attainment (EDU), household size (HOUSEHOLD), and vehicle ownership status (VEH.). These variables were selected based on their established theoretical relevance in discrete choice and transport equity literature and their alignment with the socioeconomic dimensions most likely to shape utility evaluation in the Nigerian intercity railway service.

The analytical method adopted is binary logistic regression. The model in line with the theoretical framework of this study can determine the probability of choosing train travel over road travel is expressed as the odds of train use, defined as the ratio of the probability of railway use to the probability of road use:

$$\text{Odds of Train Travel} = \text{Probability of Train Travel} / \text{Probability of Road Travel}$$

The probability of train use is thus modeled as:

$$P(T_1) = 1 / (1 + e^{-(b_0 + b_1x_1 + b_2x_2)}) \quad (1)$$

Where:

$b_0$  is the model constant,

$b_1 \dots b_n$  are the regression coefficients for each predictor

$x_1 \dots x_n$  represent the eight socioeconomic independent variables that were used in this model.

The model coefficients are estimated using maximum likelihood estimation. The reference mode for the dependent

variable is railway travel, and all odds ratios  $\text{Exp}(B)$  are interpreted relative to the baseline category of each independent variable. The binary logistic regression model was processed in IBM SPSS Statistics version 25 using the Enter method, whereby all independent variables are included simultaneously.

The analysis is presented in two stages. Block 0 evaluates the model without the inclusion of any predictor variables to establish a baseline performance level, and to identify variables most likely to contribute to the final model. Block 1 introduces all eight socioeconomic predictors simultaneously and assesses the improvement over the null baseline.

Model fit and explanatory power were evaluated using several complementary diagnostics. The Omnibus Test of Model Coefficients (Chi-Square) was used to test whether the inclusion of the independent variables produced a statistically significant improvement over the null model. The Nagelkerke  $R^2$ , a pseudo-coefficient was reported as a measure of the proportion of variance in the dependent variable accounted for by the independent variables collectively. The Hosmer and Lemeshow goodness-of-fit test was used to assess the calibration of the model's predicted probabilities against observed outcomes, with a significance value above 0.05 indicating an acceptable fit. Overall classification accuracy was assessed through the classification table, comparing the proportion of rail users and non-users correctly predicted at both Block 0 and Block 1. Individual variable significance was evaluated at the 95% confidence level ( $p \leq 0.05$ ), with odds ratios  $\text{Exp}(B)$  reported for all predictor variables to facilitate substantive interpretation of effect sizes.

## 4. Result and Discussion

The result of the model fit for the logistic regression shows the overall predictive accuracy of the model improved from 67.3% under the baseline model (Block 0) to 74.8% following inclusion of the explanatory variables. This is indicative of a reasonable explanatory strength in distinguishing between rail users and non-users.

**Table 1.** Block 1 Classification Table (Source: Binomial Logistic Regression from SPSS 25)

|        | Observed              | Predicted:<br>Yes | Predicted:<br>No | % Correct |
|--------|-----------------------|-------------------|------------------|-----------|
| Step 1 | USE OF TRAIN<br>– Yes | 640               | 80               | 88.9%     |
|        | USE OF TRAIN<br>– No  | 190               | 160              | 45.7%     |
|        | Overall Percentage    |                   |                  | 74.8%     |

A statistically significant improvement over the null specification ( $\chi^2 = 24.273$ ,  $p = 0.042$ ) and demonstrated acceptable goodness-of-fit (Hosmer–Lemeshow  $p = 0.831$ ) confirms the model is reliable and fit for modeling travel

choice among passengers using the service. However, the moderate explanatory capacity of the model, where the combined effect of all independent variables on the dependent appears moderate. The result shows the Nagelkerke  $R^2 = 0.283$  suggest variables entered into the model accounts for just 28.3% of the choice factors influencing railway usage. The remaining 71.7% can be attributed to factors that have not been input into the model.

**Table 2.** Block 1 Model Test Parameters (Source: Binomial Logistic Regression from SPSS 25)

| Test                                            | Statistic | df | Sig.  |
|-------------------------------------------------|-----------|----|-------|
| Omnibus Test of Model Coefficients (Chi-Square) | 24.273    | 14 | 0.042 |
| -2 Log Likelihood                               | 110.998   | —  | —     |
| Cox & Snell $R^2$                               | 0.203     | —  | —     |
| Nagelkerke $R^2$                                | 0.283     | —  | —     |
| Hosmer and Lemeshow Test (Chi-Square)           | 3.538     | 7  | 0.831 |

Within the framework of Random Utility Theory, the findings suggest that passengers evaluate rail and road alternatives based on perceived utility maximisation rather than infrastructure availability alone. The significance of gender, marital status, and income indicates that the utility derived from rail travel is socially differentiated across passenger categories. Female passengers were significantly more likely to use rail than male travellers ( $\text{Exp}(B) = 2.803$ ,  $p = 0.044$ ), implying that women may associate greater utility with railways relative to road transport. This outcome aligns with [29] that found that women have distinct safety and security needs in transit environments, frequently adjusting their travel behaviour and modal choices to avoid environments perceived as threatening. Within the Nigerian intercity context, where road transport is often characterised by congestion, driver aggression, and insecurity concerns, rail may represent a comparatively safer and more predictable mobility option for female passengers.

Marital status of passengers equally emerged as a significant predictor of intercity rail choice. Married respondents were substantially less likely to use narrow gauge rail service relative to single passengers ( $\text{Exp}(B) = 0.049$ ,  $p = 0.046$ ), indicating that household structure exerts important influence on modal behaviour. This finding supports evidence from [15], who demonstrated through longitudinal analysis of couple households that life events and household structure significantly alter travel behaviour and modal choices, independently of income or age, with married individuals particularly constrained by domestic and family-related mobility obligations. From a Random Utility perspective, the operational limitations of the rehabilitated narrow-gauge system, particularly prolonged journey duration, limited schedule flexibility, and constrained service frequency, may reduce its comparative utility for married travellers whose

mobility decisions may be tightly conditioned by temporal coordination and dependent-related travel obligations.

Income emerged as the strongest positive predictor of rail use ( $\text{Exp}(B) = 2.021$ ,  $p = 0.023$ ), with higher income, passengers are approximately twice as likely to choose the rehabilitated narrow-gauge railway service. This finding is analytically important as it departs from the longstanding residual perception of Nigeria's rail transport as a mobility option for lower-income travellers. Interpreted through the lens of the Transport Captivity–Choice Framework, the result suggests that the surge in passenger traffic on narrow-gauge service cannot be explained exclusively by transport captivity. Rather, the rehabilitated service appears capable of attracting at least a segment of discretionary users who possess alternative modal options. Nonetheless, these may perceive rail as comparatively advantageous only under certain travel conditions. This interpretation is consistent with evidence from [3], who demonstrates that higher income passengers disproportionately utilise rail services, and that road-related costs and congestion are key factors influencing discretionary modal choices toward public transport. In the present study, the positive income effect therefore suggests that rehabilitated narrow gauge rail services may be gradually extending beyond their traditional transport captive population. An effect that might have arisen from the inclusion of brand-new coaches and the extensive train station upgrade along the rail corridor.

The findings also possess important implications within the framework of Transport Equity. Transport equity theory argues that public transport systems should distribute accessibility opportunities across socially diverse groups rather than functioning solely as residual welfare services for economically constrained users. Historically, Nigeria's narrow-gauge railway has been socially residualised as “transportation for the poor” due largely to decades of infrastructural decline, slow service, and low operational prestige. The significance of income in this study complicates that traditional narrative by indicating that the rehabilitated system may now possess sufficient attractiveness to penetrate segments of the economically mobile population. Nevertheless, the persistence of statistically differentiated patronage across gender and marital categories also suggests that the benefits remain unevenly distributed across social groups, implying that full social inclusiveness has not yet been achieved.

By contrast, age, education, occupation, household size, and vehicle ownership did not demonstrate statistically significant influence on intercity rail choice. The absence of a significant age effect suggests that rail use within the corridor is not strongly differentiated across life-cycle categories, while the non-significance of education indicates that formal educational attainment does not independently shape railway preference. Similarly, occupation failed to demonstrate stable explanatory influence, implying that employment category alone may inadequately capture the practical constraints underlying intercity modal decisions. These findings correspond with evidence from [9] and [12], whose systematic review of mobility attitudes and mode

choices revealed that service attributes and contextual factors frequently exert stronger explanatory influence on modal behaviour than demographic characteristics alone.

The non-significance of vehicle ownership is noteworthy because private vehicle access conventionally suppresses public transport dependence in many transport systems. Its insignificance in this study suggests that car ownership does not entirely eliminate demand for rail-based intercity movement within the corridor examined. Comparable findings have been reported by [7] in contexts where public transport retains competitive relevance despite rising automobile ownership because it offers comparative advantages for longer-distance movement, fatigue reduction, cost savings, or travel reliability. Within the Nigerian context, this may indicate that rail demand is shaped less by ownership status itself than by the comparative performance of rail and road services under prevailing operational conditions.

**Table 3.** Socioeconomic Predictors of Passenger Choice of Intercity Narrow Gauge Railway Service (Source: Binomial Logistic Regression from SPSS 25)

| Variable                | B      | S.E.  | Wald  | df | Sig.   | Ex(B) |
|-------------------------|--------|-------|-------|----|--------|-------|
| SEX                     | 1.031  | 0.511 | 4.067 | 1  | 0.044* | 2.803 |
| MARTAL<br>(ref: single) |        |       | 4.311 | 2  | 0.116  |       |
| MARIT. (married)        | -3.013 | 1.512 | 3.970 | 1  | 0.046* | 0.049 |
| MARIT<br>(divorced)     | -2.487 | 1.529 | 2.644 | 1  | 0.104  | 0.083 |
| OCCUP<br>(ref: stdnt)   |        |       | 7.319 | 3  | 0.062  |       |
| OCCUP –<br>Unemp.       | 1.776  | 0.975 | 3.320 | 1  | 0.068  | 5.908 |
| OCCUP –<br>Self-emp.    | -0.106 | 0.934 | 0.013 | 1  | 0.910  | 0.900 |
| OCCUP – Paid<br>emp.    | 1.288  | 0.834 | 2.387 | 1  | 0.122  | 3.626 |
| INCOME                  | 0.703  | 0.310 | 5.139 | 1  | 0.023* | 2.021 |
| AGE                     | -0.051 | 0.371 | 0.019 | 1  | 0.890  | 0.950 |
| EDU (ref: no<br>edu)    |        |       | 5.733 | 4  | 0.220  |       |
| EDU.<br>Primary         | 0.085  | 1.790 | 0.002 | 1  | 0.962  | 1.088 |
| EDU<br>Secondary        | 1.235  | 0.893 | 1.914 | 1  | 0.167  | 3.437 |
| EDU –<br>OND/Dip        | 0.474  | 0.658 | 0.520 | 1  | 0.471  | 1.607 |
| EDU-BSc/HND             | -0.967 | 0.829 | 1.363 | 1  | 0.243  | 0.380 |
| H/HOLD SIZE             | -0.128 | 0.364 | 0.123 | 1  | 0.726  | 0.880 |
| VEH. OWN                | -0.416 | 0.286 | 2.109 | 1  | 0.146  | 0.660 |
| Constant                | 0.023  | 1.907 | 0.000 | 1  | 0.990  | 1.023 |

Overall, the findings suggest that intercity rail patronage on Nigeria's rehabilitated narrow-gauge corridor cannot be

explained entirely through traditional assumptions of transport captivity or low-income dependence. Rather, the results indicate the emergence of a more socially differentiated pattern of rail use in which both captive and discretionary mobility considerations interact in shaping passenger behaviour. However, the moderate explanatory power of the model equally demonstrates that substantial variation in rail choice remains attributable to non-socioeconomic service variables such as reliability, travel time, station accessibility, comfort, and operational quality. From a transport policy standpoint, this reinforces the proposition that sustainable railway revitalisation in Nigeria will depend not merely on infrastructure rehabilitation, but on the extent to which restored services generate sufficient utility, inclusiveness, and competitive attractiveness to retain socially diverse passenger groups within an overwhelmingly road oriented mobility environment.

## 5. Conclusions

The findings of this study indicate that passenger socioeconomic characteristics play a selective rather than a universal role in shaping narrow-gauge rail patronage. Gender, marital status, and income acting were the only statistically significant predictors.

These results suggest that narrow-gauge rail demand is socially differentiated, but only along a limited set of dimensions. The pattern also indicates that rail choice cannot be reduced to a simple socioeconomic profile and that other factors, such as service quality, affordability, reliability, station access, safety, and travel time, are likely important, possibly more important determinants of modal choice on this corridor.

The practical implication is that efforts to strengthen ridership on the narrow-gauge system should extend beyond passenger profiling to address the wider determinants of service attractiveness. Rail planning should be grounded in a passenger-centred approach that addresses both cost sensitivity and service quality that responds to the specific travel needs of key user groups. Railway policy must therefore target continuous improvement of stations and rolling stock if the desired modal shift of passengers is to cut across socio-economic groups.

This study contributes to the literature by demonstrating that, in the Nigerian intercity context, socioeconomic effects on narrow-gauge rail choice are present but limited in scope. Future research should incorporate service quality perceptions, travel time, accessibility, perceived safety, and trip purpose into a more comprehensive demand model. Comparative studies across different rail corridors, particularly on the new standard gauge lines.

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