The Transportation Mode Choice and Carrier Selection Behavior of Rajshahi City Dwellers in Bangladesh

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Abstract. One of the most crucial steps in the planning process for transportation is mode selection, which directly affects the way decisions are made. Like the majority of other developing nations, Bangladesh lacks accurate level-of-service statistics for the full range of motorized and nonmotorized modes utilized by travelers. Rajshahi, one of Bangladesh's largest cities with a population of 1 million, there are major variations in this enormous population's access to and cost of various modes of transportation. This study explores the complex dynamics of consumers' choices for modes of transportation and carrier selection in Rajshahi, which is impacted by a wide range of elements, including as socioeconomic position, easy access, education, trip purpose, waiting time, gender, price, and environmental concerns. Here these variable data were collected from almost every ward of Rajshahi City through a questionnaire survey. These variable data were analyzed by Multinomial Logit Model, and Binary Logit Model. Here firstly the choice of mode for intercity movement of Rajshahi city dwellers were analysed by multinomial logit model using 270 data. While doing this, the bus was chosen as the reference mode so that other modes could be compared to it. According to the analysis, respondents' choices were significantly impacted by three predictors: economic status, frequency of travel, and occupation, with P values of 0.000, 0.012, and 0.042 respectively. From the odd ratio, a detailed relationship demonstrating how these three predictors and others influenced people's choice of mode was discovered. For instance, respondents who relocate on a monthly or infrequent basis travel by train 1.950 times more frequently than they do by bus. Subsequently, as the majority of respondents (62% of the total data) chose "Train" as their mode of transportation, a Binary logit model was developed to conduct additional analysis and determine the factors that influenced the respondents' decision to select this mode over all others. The results of the analysis showed that respondents' Income and whether or not they move monthly or rarely had a substantial impact on their decision to

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prioritize trains. P values of 0.021 and 0.005, respectively, are displayed. Subsequently, a comprehensive correlation was found from the odd ratio, which illustrated how people's priorities were influenced by these two predictors as well as other factors. Then for the mode choice for movement of respondents inside Rajshahi, it was noticed that out of 312 points in the dataset, 50% of respondents said they travel within Rajshahi using CNG or an auto. In order to determine the elements that made the mode more significant than all other modes, a binary logit model was finally proposed once more. It demonstrates that the respondent's cost and employment status had a substantial impact, with P values of 0.000 and 0.024, respectively. According to the odd ratio, respondents with low incomes use autos 2.227 times more frequently than respondents with relatively high incomes.

Keywords: Binary Logit Model, Mode of Choice, Multinomial Logit Model, Transportation Engineering

1 Introduction

The Strategic initiatives and dedication to infrastructure development have driven Bangladesh's transportation engineering sector into a revolutionary growth trajectory (Md. M. Islam et al., 2023). Selecting a mode of transportation is perhaps one of the most significant traditional approaches in transportation planning. This occurs as a result of public transportation's significant influence over policy decisions (Chandra & Chalumuri, 2014). The growing number of cars in cities results in environmental issues, traffic jams, and delays, all of which have a significant negative impact on the economy annually. While switching from private to public transportation looks like a solution, it is difficult to implement because of how comfortable public transportation is. To improve these worsening transportation circumstances, researchers have conducted studies to determine the relationship between the mode of choice and other elements influencing it. Along with determining important transportation performance criteria, choosing a mode of transportation and a carrier, debating over prices and service standards, and assessing carrier performance are all steps in the decision-making process for transportation (Meixell & Norbis, 2008).

1.1 Bangladesh Transport Sector Review

Road Transport. In Bangladesh, public road transportation plays a crucial role in meeting the different commuting needs of the people. This is especially true in urban areas like Rajshahi. The primary mode of public transportation, linking people throughout cities and regions, is the bus, minibus, rickshaw and auto rickshaw. In Bangladesh, there are many different types of private transportation available, according to people's different demands and tastes. The predominant modes of private transport include: cars, motorcycles and bicycles (Md. M. Islam et al., 2019).

Rail Transport. One of Bangladesh's primary transportation networks, the Bangladesh Railway links all of the nation's major cities and towns with one another. The railway not only serves as a means of transportation for people and products, but it also helps to lessen traffic on surrounding roads, bridges, and tunnels (Huq & Muntaha, 2022). The railway system in Bangladesh effectively covers about 32% of the country's total area. The entire length of the railway as of 2005 is 2,706 kilometres (1,681 mi) (M. Islam & Hoque, 2020).

Air Transport. Domestic aviation is essential for promoting connection between cities and regions in Bangladesh. Through their network of domestic airports, Bangladesh's airlines provide travellers a quick and cost-effective way to get around the country's varied landscapes. For people with tight schedules, like business travellers, domestic air travel is very helpful.

1.2 Relevance of model with mode choice analysis

Being one of Bangladesh's largest cities, Rajshahi's mode and carrier selection are of utmost importance to the city's inhabitants. Researchers define the relationship between the explanatory variables and the binary result using the Binary Logit Model. This model is used when the dependent variable has two possible outcomes (e.g., Yes/No, 0/1). In transportation planning, it could be employed to predict binary choices, such as whether an individual chooses to move by a a car (1) or not (0), or whether someone takes public transport (1) or doesn't (0) etc. It analyses the relationship between the dependent variable and predictors (e.g., travel time, cost, occupation, frequency of trip, demographics etc.) to predict the likelihood of a particular outcome. It aids in comprehending binary transportation decisions, such as choosing to drive a car or take public transportation, among other dichotomous alternatives. For example, it may forecast the probability of riding a bike to work depending on variables like demographics, weather, and distance. There is another model named multinomial logit model. When there are more than two distinct outcomes for the dependent variable, this model is employed. It is useful for studying mode choice in transportation planning, when people can choose from a variety of modes of transportation (such as a car, bus, train, etc.). It forecasts the likelihood of choosing each mode in relation to a selected reference category while taking into account a number of predictors or influencing variables. Here we found the choice of mode both inside and outside Rajshahi by the previously mentioned two model. We found out people’s choice over different vehicles for going out of Rajshahi and also for moving in Rajshahi. Here Multinomial Logit model was used for comparing data with respect to a reference data and Binary Logit model was used to identify why one mode is preferred over another. The objectives of the study (1) to create a mathematical model for the mode of transportation decisions using multinomial logistic regression (2) To determine the several elements that impact a respondent's choice of transportation (3) to determine the probability that people from various socioeconomic and demographic backgrounds will select various forms of transportation.

2 Methodology

2.1 Data collection

In this study information was gathered using a survey questionnaire. This article mostly discussed Rajshahi's both inside and outside. 496 people were chosen at random using the convenience sampling technique and a thoughtfully crafted questionnaire. Explanatory factors (gender, age, occupations, economic status, last study level, reason for trip, time of trip, frequency of trip, if time matters, fare, mode of transportation) and the category result or decision made are included in this data. After scrutinizing, 270 respondent's data were selected for analysing to determine mode choice for moving outside Rajshahi and 312 respondent's data were selected to determine mode choice for moving inside Rajshahi. Using SPSS software, multinomial logistic regression and binary logistic regression are performed by taking these factors into account. After that, the variables are organized as follows.

2.2 Study variables for multinomial logit model (Outside Rajshahi)

We have taken into consideration the modes of transportation as a response variable in this study. The following types of transportation mode are taken into consideration:
(1) Bus (2) Train (3) Plane (4) Private Car

2.3 Regressor Variables

The selections might be influenced by a number of variables named regressor variables. Here, we've just looked at some of these variables: (1) Gender (2) Economic status (based on monthly income in BDT) (3) Cause of trip (4) Frequency of trip (5) If time matters (duration of journey) (6) Occupation (7) Time of trip.

2.4 Categories of Regressor Variables

Table 1. Categories of regressor variables

Category	Variables
Gender	1.Male 2. Female
Economic Status	1.Low (below 10k) 2. Medium (10k-40k) 3. High (above 40k)
Cause of Trip	1.Work 2. Education 3. Tour 4. Others
Time of Trip	1.Morning (6 AM-11 AM) 2. Mid-Day (11 AM-5 PM) 3. Evening (5 PM-8 PM) 4. Night (8 PM-6 AM)
Frequency of Trip	1.Daily 2. Weekly 3. Monthly 4. Rarely
If Time Matters	1.Yes 2. No
Occupation	1. Student 2. Others 3. Corporate job 4. Govt. job

3 Result and Discussion

3.1 Postulated Model (multinomial logit model)

A brief overview of the collected data is represented at a glance in the corresponding pie chart (Figure 1) and Table 2.

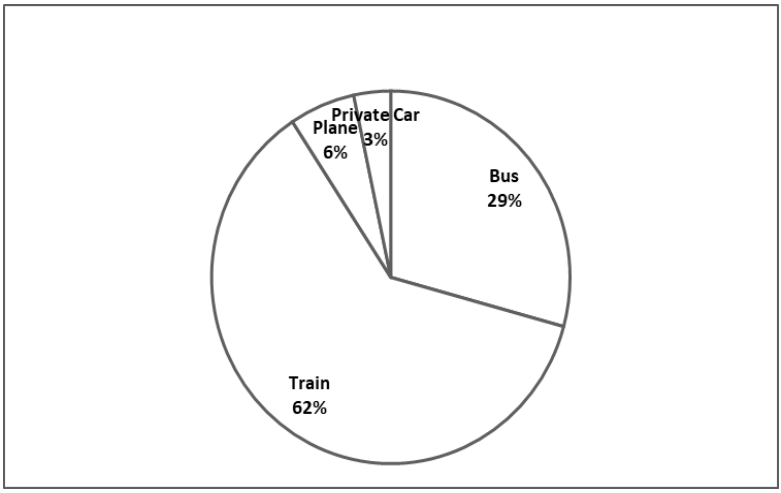

Fig. 1. Pie chart for mode of transportation choice outside Rajshahi

Table 2. Case Processing Summery

		N	Marginal Percentage
Mode of Transport	Bus	79	29.3%
	Train	166	61.5%
	Plane	16	5.9%
	Private Car	9	3.3%
Valid		270	100.0%
Missing		0	
Total		270	
Subpopulation		163[a]	

According to Table 2 and Figure 1, the majority of respondents prefer to go outside of Rajshahi by train.

Estimation and Test of Postulated Model (multinomial logit model). In this case, the multinomial logistic model's parameters were estimated using the maximum likelihood approach, and the developed hypothesis was tested using the likelihood ratio

test and Wald test. We obtain the following model fitting data by using the SPSS application.

Likelihood Ratio Test. The impacts of the chosen variables do not differ significantly from one another, according to null hypothesis. And the confidence level of the test was considered 95%.

Table 3. Model fitting information

Model	Model Fitting Criteria			Likelihood ratio test		
	AIC	BIC	-2 Log likelihood	Chi-square	df	Sig.
Intercept only	426.329	437.125	420.329	-	-	-
final	386.824	473.186	338.824	81.506	21	0.000

The full model containing all predictor $\chi 2(21, N= 270) =81.506$. The Significance value, P=0.000 which is less than 0.05. It indicates that the model is highly significant.

Table 4. Goodness of Fit

	Chi-Square	df	Sig.
Pearson	366.998	465	1.000
Deviance	278.342	465	1.000

From the table 4, the significance value is greater than 0.05 so the model is highly significant.

Table 5. Likelihood Ratio Test

Effect	Model Fitting Criteria			Likelihood Ratio Test		
	AIC of Reduced Model	BIC of Reduced Model	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	399.326	474.893	357.326	18.503	3	0.000
Gender	381.838	457.404	339.838	1.014	3	0.798
Economic Status	411.974	487.540	369.974	31.150	3	0.000
Cause of Trip	384.902	460.468	342.902	4.078	3	0.253
Time of Trip	383.470	459.037	341.470	2.646	3	0.449
Frequency of Trip	391.826	467.393	349.826	11.003	3	0.012
If Time Matters	384.476	460.043	342.476	3.652	3	0.302
Occupation	389.035	464.602	347.035	8.212	3	0.042

Comment. On the basis of likelihood ratio test, it has been observed that the economic status, frequency of trip and occupation these three parameters show significance value 0.000, 0.012, 0.042 respectively. All of these three values are less than 0.05. So, these three parameters are highly significant for influencing the respondents in their mode selection.

Table 6. Estimation and wald test

Mode of transport		B	Std. Error	Wald	Df	Sig.	Exp(B)	95% confidence interval for Exp(B)	
								Lower Bound	Upper Bound
Train	Intercept	-0.749	1.192	0.394	1	0.530	-	-	-
	Gender	-0.049	0.319	0.020	1	0.887	0.956	0.511	1.786
	Economic Status	0.153	0.254	0.363	1	0.547	1.166	0.708	1.918
	Cause of trip	0.114	0.169	0.455	1	0.500	1.120	0.805	1.559
	Time of trip	-0.037	0.154	0.057	1	0.812	0.964	0.712	1.305
	Frequency of trip	0.668	0.223	8.967	1	0.003	1.950	1.260	3.019
	If time matters	-0.016	0.314	0.003	1	0.959	0.984	0.531	1.823
	Occupation	-0.186	0.184	1.028	1	0.311	0.830	0.579	1.190
Plane	Intercept	-13.383	3.717	12.961	1	0.000	-	-	-
	Gender	0.587	0.673	0.762	1	0.383	1.799	0.481	6.723
	Economic Status	2.231	0.660	11.432	1	0.001	9.309	2.554	33.928
	Cause of trip	-0.150	0.321	0.218	1	0.640	0.861	0.459	1.615
	Time of trip	0.520	0.370	1.970	1	0.160	1.682	0.814	3.475
	Mode of transport	B	Std. Error	Wald	Df	Sig.	Exp(B)	95% confidence interval for Exp(B)	
								Lower Bound	Upper Bound
	Frequency of trip	1.030	0.596	2.988	1	0.084	2.801	0.871	9.005
	If time matters	1.727	1.115	2.400	1	0.121	5.625	0.633	50.012
	Occupation	0.150	0.345	0.190	1	0.663	1.162	0.591	2.283
Private Car	Intercept	-2.614	3.963	0.435	1	0.510	-	-	-
	Gender	0.302	0.954	0.100	1	0.752	1.352	0.209	8.764
	Economic Status	2.262	0.603	14.074	1	0.000	9.605	2.946	31.318
	Cause of trip	-0.772	0.506	2.329	1	0.127	0.462	0.171	1.246
	Time of trip	0.226	0.453	0.247	1	0.619	1.253	0.515	3.047
	Frequency of trip	0.781	0.727	1.155	1	0.283	2.183	0.526	9.071
	If time matters	0.179	0.917	0.038	1	0.845	1.196	0.198	7.211
	Occupation	-0.920	0.390	5.564	1	0.018	0.399	0.186	0.856

- The reference category is bus

(Though the choice of reference category is arbitrary and doesn't affect the model's performance inherently, many people who use the train opt for the bus as their next choice, using "Bus" as the reference category helps to compare directly the likelihood of choosing other modes (Train, Plane, Car) over the Bus.)

Interpretation of the wald test and significance of variables. Interpretation of Table 9 during comparing the factors that affect the respondents of choosing train over bus, it has been seen that only 'frequency of trip' is highly significant. The 'frequency of trip' predictor is positive and significant (B=0.668, s.e.=0.223, Sig.=0.003). It has an odd ratio of 1.950. It indicates that respondents who move monthly or rarely use train as their mode of transportation 1.950 times more than bus.

Here we can also see that the predictor variable occupation is negative and somehow significant (B= -0.186, s.e.=0.184, Sig.=0.311). It has an odd ratio of 0.579, which is less than 1. It indicates that the govt. job and private job holder use train as their mode of transportation 0.830 times less than students and others over bus.

During comparing the factors that affect the respondents of choosing train over bus, it has been seen that only 'economic status' is highly significant. The 'economic status' predictor is positive and significant (B=2.231, s.e.=0.660, Sig.=0.001). It has an odd ratio of 9.309. It indicates that respondents who has comparatively high economic status use plane as their mode of transportation 9.309 times more than bus.

Though the variable 'occupation' is not significant here but it has an odd ratio of 1.162. It indicates that the govt. job and private job holders use plane 1.162 times higher than the students and others over bus.

During comparing the factors that affect the respondents of choosing private car over bus, it has been seen that 'economies status' is highly significant.

The 'economic status' predictor is positive and significant (B=2.262, s.e.=0.603, Sig.=0.000). It has an odd ratio of 9.605. It indicates that respondents who has comparatively high economic status use private car as their mode of transportation 9.605 times more than bus.

3.2 Postulated Model (Binary logit model): Outside Rajshahi

Binary logistic regression analysis is used to estimate the relationship between a dichotomous dependent variable and independent variable.

Based on the statistics performed above it is evident that most of the respondents (61.5%) use train as their mode of transport for moving outside Rajshahi. So, a binary logit model is derived for comparing different factors of choosing train over other modes of transport. Here we have considered those number of respondents as 'yes' who move by train and the rest number of respondents as 'no'.

Table 7. Categorical Variables Coding

		Frequency	Parameter coding (1)
Job holder	No	190	.000
	Yes	80	1.000
Time matters	No	194	.000
	Yes	76	1.000
Monthly rarely	No	11	.000
movement	Yes	259	1.000
Gender	No	80	.000
	Yes	190	1.000
Income matters	No	102	.000
	Yes	168	1.000

Beginning of the postulated model. Omnibus test was done initially. By grouping the predictors together, this test looks for any significant relationships between the predictors and the result. It also checks if the overall model (all coefficients together) significantly deviates from a model where all coefficients are zero (i.e., no relationship between predictors and the outcome).

Table 8. Omnibus Tests of Model Coefficients

	Chi- square		df	Sig.
Step 1	Step	20.906	6	.002
	Block	20.906	6	.002
	Model	20.906	6	.002

As the significance values are less than 0.05 in all cases, the model is highly significant.

Next, the Hosmer-Lemeshow test was run. This test allows to evaluate how well the logistic regression model fits data by comparing expected and observed outcomes across several groups or data bins.

Table 9. Hosmer and Lemeshow test

Step	Chi-square	df	Sig.
1	4.535	8	.806

As the significance is higher than 0.05, it indicates that the model is good fitted.

Interpretation of the model. The binary logistic regression was performed to assess the impact of several factors on the likelihood that respondents would report that they travel by train.

The model contains six independent categorical variables (Income, Time matters, monthly rarely movement, Gender, Job holder). In all cases except gender and income, No is defined as 0 and Yes is 1. For gender 0 means female, 1 means male. For income 0 means high, 1 means low. The full model containing all predictor was statistically significant $\chi 2(6, N= 270) =20.906$, $P<0.005$, indicating that the model was able to distinguish between respondents who travel by train and who do not.

Table 10. Variables in the Equation

		B	S. E.	Wald	df	Sig.	Exp(B)	95% of C.I. for Exp(B)	
								Lower	Upper
Step1 [a]	Age in years	-0.028	.029	.965	1	.326	.972	.919	1.029
	Income (1)	0.801	.346	5.356	1	.021	2.228	1.130	4.390
	Time matters (1)	0.286	.308	.858	1	.354	1.330	.727	2.435
	Monthly or rarely movement (1)	2.363	.833	8.042	1	.005	10.619	2.074	54.360
	Gender (1)	0.170	.293	.335	1	.563	1.185	.667	2.104
	Job holder (1)	0.329	.449	.538	1	.463	1.390	.576	3.353
	constant	-1.869	1.136	2.707	1	.100	.154	-	-

As shown in Table 12 only two independent variables make a unique statistically significant contribution to the model (income, monthly and rarely movement). The first one shows an odd ratio of 2.228. It indicates that people whose income level is high use train 2.228 times more than those whose income level is low. This result is quite surprizing. The second one has an odd ratio of 10.61. It indicates that respondents who moves outside Rajshahi monthly or rarely use train as their mode of transport 10.619 times higher than those who moves daily or weekly.

Apart there is one other variable called 'time matters' which bears a mentionable odd ratio. Though it is less significant than the previous two. It shows an odd ratio of 1.330 that indicates that respondents who has sensitivity of time use train 1.330 times more than those who are not sincere about time.

3.3 Postulated Model (Binary logit model): Inside Rajshahi

From the data collected form respondents' percentage of choosing different modes of transportation are given in the Fig. 2.

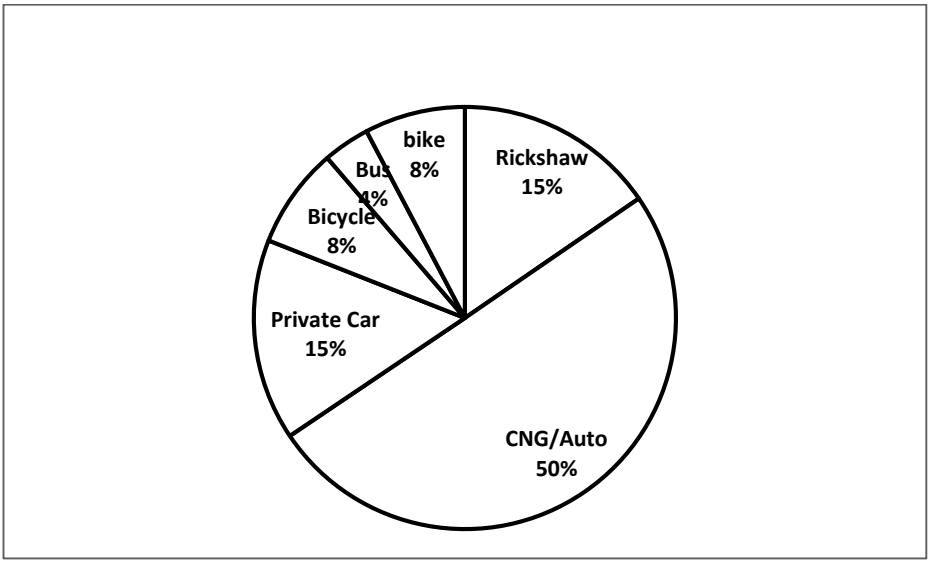

Fig. 2. Pie chart for mode of transportation choice inside Rajshahi

From the figure we can see that the maximum number of respondents use CNG/Auto as their medium of transport. So, a binary logit model is derived for comparing different factors of choosing CNG/Auto over other mode of transport. Here we have considered those number of respondents as 'yes' who move by CNG/Auto and the rest number of respondents as 'no'.

Table 11. Categorical Variables Coding

		Frequency	Parameter coding (1)
Respondent job holder	No	180	.000
	Yes	132	1.000
Income	No	228	.000
	Yes	84	1.000
Does education matter	No	252	.000
	Yes	60	1.000
Does cost matter	No	144	.000
	Yes	168	1.000
		Frequency	Parameter coding (1)
Does time impacts	No	60	.000
	Yes	252	1.000
Gender	Male	228	.000
	Female	84	1.000

Beginning of the postulated model. Here firstly the model was built and run without any independent variable. The result is presented in the table.

Table 12. Classification Table[a,b]

Observed			Predicted		
			Mode		Percentage Correct
			No	Yes	
Step 0	Mode	No	0	156	0
		Yes	0	156	100.00
Overall percentage					50.0

a. Constant is included in the model.

b. The cut value is .500

Null hypothesis, H0: There is no relationship among the predictor variables and the outcome (whether a respondent will choose CNG/Auto as their mode of transport or not). Without considering any independent variable correct percentage of the null model is 50%. After first step the second step was presented in the Table 10.

Table 13. Omnibus Tests of Model Coefficients

		Chi- square	df	Sig.
Step 1	Step	210.984	7	.000
	Block	210.984	7	.000
	Model	210.984	7	.000

As the significance is less than .05 in all cases the model is highly significant.

Table 14. Classification Table[a]

Observed			Predicted		
			Mode		Percentage Correct
			No	Yes	
Step 1	Mode	No	156	0	100.0
		Yes	24	132	84.6
Overall percentage					92.3

a. The cut value is .500

Alternative hypothesis, Ha: There is relationship among all the predictor variables and the outcome (whether a respondent will choose CNG/Auto as their mode of transport or not). The overall correct percentage of the model after considering all independent predictor variables are 92.3%, where the null model could predict 50% correctly. So, after adding independent predictor variables, the model can do significantly more correct prediction. The sensitivity of the model is 84.6%. The specificity of the model is 100%.

Interpretation of the model. The binary logistic regression was performed to assess the impact of several factors on the likelihood that respondents would report they travel by CNG/Auto.

The model contains six independent categorical variables (Gender, income, does education matter, does cost matter, does time impact, is the respondent a job holder). In all cases except gender and income No is defined as 0 and Yes is 1. For gender 0 means male, 1 means female. For income 0 means high, 1 means low. The full model containing all predictor was statistically significant $\chi 2(\ 7, N= 312)=210.98$, $P<0.001$, indicating that the model was able to distinguish between respondents who travel by CNG or Auto and who do not. The model correctly classified 92.3% of cases as shown in table 15.

Table 15. Variables in the Equation

		B	S. E	Wald	df	Sig.	Exp(B)	95% of C.I. for Exp(B)	
								Lower	Upper
Step1[a]	Gender (1)	.478	.520	.842	1	.359	1.612	.581	4.471
	Income (1)	.801	.533	2.093	1	.148	2.275	.753	6.589
	Does education matter (1)	42.248	5265.9	0.000	1	.994	2.228E+18	0.000	-
	Does cost matter (1)	-2.380	.501	22.563	1	0.000	.093	.035	.274
	Respondent job holder (1)	-1.826	.808	5.111	1	.024	.161	.033	.784
	Does time impacts (1)	21.290	3377.8	0.000	1	.995	1763245537	.000	-
	constant	-19.18	3377.8	0.000	1	.995	0.000	-	-

a. Variable(s) entered on step 1: Gender, Age, Economic status, Edu matters, cost matters, Time impacts, Jobholder.

As shown in Table 15 only two independent variables make a unique statistically significant contribution to the model (Does cost matter, is the respondent a job holder). Among these two the second one is strongest predictor as it shows higher odd ratio then the first one. The odd ratio 0.161 indicated that the respondents who are job holder uses CNG/Auto 0.161 times less likely than those respondents who does not hold any job, controlling for all other factors in the model. Apart there is one other variable who has mentionable odd ratio. Income (1) shows an odd ratio of 2.227 which indicates that respondents who has low income use Auto 2.227 times more than those who have comparatively high income.

4 Conclusion

The study proves an overall outline of mode of choice of transportation. Here basically we divided the study into two categories one is for moving inside Rajshahi and another is for moving outside from Rajshahi. The summery of sample data was shown in figure 1 and figure 2. Figure 1 gives an overview that respondents prefer bus (29.3%), train (61.5%), plane (5.9%) and private car (3.3%) as a mode of transportation for moving outside from Rajshahi. From this data set by using multinomial logit model, it is found that students and people who moves outside Rajshahi monthly uses train more as a medium of transport on the other hand people who are job holders and high economic status uses plane and private car for their mode of transport. As train was the mostly used medium of transportation, binary logit model was derived for making further analysis to find out the predictors which influence the respondents for choosing train. It also shows that income level and frequency of travel (whether daily, monthly etc) have a significant effect on the respondent's choice. In details it has been noticed that people whose income level is higher uses train more though the ticket fare of Bangladesh Railway is comparatively low than the other available modes. The reason behind it can be their willingness to give priority to road safety and to avoid traffic congestion over luxury. It is an indication of the dependability on Bangladesh Railway, regardless of socioeconomic background of the people. It is also seen that the number people use train frequently is less than the number of people use train monthly or rarely. It can be happened due to the unavailability of ticket on instant. There can be some other reasons for giving priority to other modes over train such as limited railway route, unwillingness of people to travel comparatively short distance. In these cases, Buses gets priority as they have comparatively more stoppage at a regular interval and availability on instant. From figure 2. Figure 1 gives an over view that respondents prefer CNG/Auto (50%) and the rest of them use bike, bicycles, bus, rickshaw and private car as a mode of transportation for moving one place to another inside Rajshahi. Form this dataset by using binary logit model, students and those people whose income level is comparatively low use CNG/Auto more than the people who are job holders and whose income level is high respectively. Here it is also found that movement time and level of education does not matters in choosing CNG/Auto.

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