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RESEARCH ARTICLE

LOGIT MODEL INTERPRETATION OF TRAVEL MODAL CHOICE/ MODAL SPLIT IN AIZAWL CITY

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Abstract

The subject matter of this study pertains to the population of Aizawl city, Mizoram. The data is based on the usage of public or private transportation by individuals irrespective of their ownership of private vehicles. The sample includes respondents who are teachers, high-school and college teachers taken separately, of all age groups, different educational backgrounds, as also different income levels who are mobile, belonging to Aizawl city and around. The study examines only the demand side factors influencing travel decisions. The supply side aspects, relating to public transports are taken as given. A study of this kind is beneficial to many parties like the government in its policy implication and also to the private entities as it is directed towards reduced travel expense. Insight of the mechanisms of the travel decision process will benefit governments to formulate policies that better address consumer's needs in transport. The study will also enable public transport managers to understand their consumer's needs preference and psyche. Furthermore, since no study of this nature has been conducted for the city of Aizawl, the present study will contribute to the birth of a recorded empirical work. It will also lead to further, deeper, more significant research in the area. This study attempts to contribute to the understanding of how local public transport demand is affected by different factors. The focus of this study is to examine the cause of preference of public transportation over private or vice versa by passengers. Considering the increased use of public transportation by individuals and especially by those who also own private vehicles, it is important to understand what causes this preference of one means over the other and the personal benefits involved with it. Careful analysis also shows that the respondents prefer private transportation to public. The logit model shows that of the variables affecting transport mode choice by individual among high school teachers that is most significant is accessibility and flexibility of the private transportation. Also the variables affecting transport mode choice by individual among college teachers that is most significant is time issues; secondly, accessibility and flexibility of the private transportation which was also observed in the preceding sections of the chapter. The small sample size, with little variability across the quantitative variables could be the reason of the low significance, yet high odd ratios.

Introduction:-

Mode choice models have always formed a critical part in analyzing the travel demand of a study area. In the travel demand model, the choice is for the mode used for travelling between a particular origin zone and a particular destination zone. Discrete choice models offer the solution to study the modal choice when individuals have to select an option from a finite set of alternatives. The probability of individuals choosing a given option is a function of their socio-economic characteristics and the relative attractiveness of the option. The factors influencing the choice of a mode may be classified into three groups:

Characteristics of the trip maker (his/her socio-economic characteristics, trip decisions, etc);

Characteristics of the journey (purpose, time of day when the journey is made);

Characteristics of the transport facility.

Davidson (1973) and Louviere et.al. (1973) published a seminar paper in transportation which alerted us to the use of methods for evaluating an individual's response to combinations of levels of attributes of modes of transport which are not observed, but which represent achievable level of service. Wide spread interest in this approach to travel behaviour, however, was slow developing due to greater interest in the development of discrete choice models activity approaches to the study of the continuous sequences of human actions over a period of time (Hensher and Stopher 1979). Louviere and Hensher showed how a preference experiment (i.e. a number of alternative mixes of attributes) could be used further to include choice experiments in which an individual chooses from among fixed or varying choice sets.

Objectives of the Study:

The objectives of the study are as presented below:

To identify the most commonly used mode of transportation of the people in and around the city of Aizawl (with reference to High School and college Teachers).

To find out the mode choice of the people of Aizawl city (with reference to High School and college Teachers) – the preferences of either public over private transportation or vice versa.

To analyze the factors affecting the preferences of public or private transports- the study attempts to understand the influence of various social, economic and personal factors that influence travel choice of passengers.

Sources of Data and Methodology:-

Selected Productivity Variables:

Important variables used in the study:

The study consists of dependent and independent variables as given:

The dependent variable is choice of means of transportation.

The independent variables included time issue (bus service time and time of travel), comfort level (security, comfort and independence of private vehicle, crowdedness of bus and likeness for driving), accessibility and flexibility (inconvenience due to access distance of bus stops, public transportation networks limitations), cost saving (taxi fares), accessibility and flexibility (inconvenience due to access distance of bus stops, public transportation networks limitations), and lastly other factors, given as others for the respondents to specify.

Sources of Data:

Primary data is used to obtain information on the individual's choice towards the means of transportation used. It was obtained through a structured questionnaire survey method through a *random sampling* approach which had been chosen and used to insure the adequate representation. This is to attain a sample representative of the travel behavior of population of the study area. In order to determine the sample size, the applied method was set to accept an error of about 5percent and confidence level of 95 percent. The sample size also depends on nature of units,

population and study, number of variables, groups and sub-groups to be studied, intended depth of analysis, precision and reliability of results required, level of expected non-response, size of questionnaire and population and available resources randomly administered among public transportation Users in and around the city of Aizawl. The data collected from the surveys was categorized on the basis of traveler type, i.e. mode choice and mode captive users. The total sample size is further affected by the total number of choice scenarios and the number of choice alternatives in a given scenario. Considering the above factors, a sample size of 240 is drawn using purposive sampling method, the focused group being High School and College Teachers..

Analysis of Empirical data:

The empirical analysis will encapsulate the discussions of the estimated parameters for modal choice behavior. The analysis is therefore broken into analyses of modal choice of college and high school teachers in Mizoram.

The Analysis of Demand:

The selection of mode of travel by urban population is determined by purpose of the journey, its frequency, timing, length, characteristic participant and their economic status. The prevalent modes of transport, or in other words, modal choice in urban areas, are as follows:

Walking:

In developing countries walking dominates urban transport for the poor, who walk most often and furthest, in India, for example, the lower income groups depend upon walking for almost 60 percent of all urban journeys (Saxena, 2005). Many of these walkers do not have a modal choice as such, for their poverty denies them the opportunity to use anything else but their feet. Even when buses are available they are frequently full, so that even many of the not-so-poor cannot actually use them. But reluctant walkers are still travelers in the urban system and planning must recognize that walking is, and will remain, a perfectly valid form of transport for most people. It is one that is entirely appropriate for many types of urban trips and it is often the most efficient, both for the walker and for the urban transport system as a whole.

Non-motorized vehicles:

In industrialized countries the pedal cycle is the principal vehicle in the category, but it rarely accounts for more than 10 percent of the modal split. It is in developing countries that non-motorized vehicles assume dominance as a means of mobility, though there is much variability between countries in the particular vehicles used.

Private cars:

In the industrial world the car is now the leading mode for all categories of journey. It is more popular because of its flexibility, personal convenience and the status that ownership confers. John Adams (1981) has calculated that the 59 poorest countries of the world, containing over 60 percent of its population, together own fewer cars than the American city of Los Angeles. The potential for future growth in the number of cars is thus enormous, although there are strong environmental and social reasons why current growth rates cannot continue for much longer. For the time being, though, the headlong dash towards global mass car ownership continues unabated.

Public transport:

Bus-based system: They are of particular importance in developing countries, where they are intensively used, with the largest Indian cities, for example, having up to 40 percent of trips made by bus. However, many vehicles are old and unreliable and although fares are low, they are still too high for many people. The flexibility and low cost of bus operation and maintenance, together with the prior existence of the necessary roadways, mean that buses are likely to remain firms favorites in cities in both industrialized and developing societies. The problems lie in clearing the road space of cars so that the advantages of the bus can be properly exploited.

Rail-based system:

New rail development can only be justified if there is a high potential ridership, so metros are typical of cities of more than a million people, though by no means do all such cities have them.

Taxis and informal modes:

They have high unit costs, especially of labor and fuel, and thus tend to be used principally by those on higher incomes and for business travel. There is also an 'informal' sector of a kind in developed countries in the form of 'car-pools' and 'van pools', whereby existing drivers share their vehicles (Saxena, 2005).

Modal choice analysis:

Modal Choice analysis- College & High School Teacher’s Modal Choice:

Econometric Model:

The aim of this was to examine the relationship between college & high school teacher’s transport mode choices and utilities offered separately.

A binary logistic is used to understand the mode choice of the individuals.

A logistic model, commonly called the logit model is when the response variable is qualitative. A binary logit model is one whose dependent variable has only two possible outcomes. The objective in such models is to find the probability of something happening. Hence it is called a probability model.

Variables used in the model:

The dependent variable used to run the regression model is the choice of means of transportation used. Therefore, the individuals’ decision in preferring private over public transportation is dependent on certain explanatory variables which are time issue (bus service time and time of travel), comfort level (security, comfort and independence of private vehicle, crowdedness of bus and likeness for driving), accessibility and flexibility (inconvenience due to access distance of bus stops, public transportation networks limitations), cost saving (taxi fares), and lastly other factors, given others for the respondents to specify.

Certain variables have been dropped to avoid multi-co linearity (Dropping Variable Method).

Predicted Value:

Table 1 & 2 shows the level of prediction for the binary logistic model used. The overall percentage of yes and no that are predicted correctly.

Classification Table 1(college)					
	Observed		Predicted		
			Prefer private over public		Percentage Correct
		Yes	no		
Step 1	Prefer private over public	Yes	87	1	98.9
		No	1	31	96.9
		Overall Percentage			98.3
a. The cut value is .500					
Source: collated from field work					

Classification Table 2(high school)					
	Observed		Predicted		
			Prefer private over public		Percentage Correct
		yes	no		
Step 1	Prefer private over public	Yes	83	1	98.8
		No	1	35	97.2
		Overall Percentage			98.3
a. The cut value is .500					

Firstly, notice that the table has a subscript which states, “The cut value is .500”. This means the probability of a case being classified into the “yes” category is greater than .500, then that particular case is classified into the “yes” category. Otherwise, the case is classified as in the “no” category. Whilst the classification table appears to be very simple, it actually provides a lot of information about the binomial logistic regression result, including:

The percentage accuracy in classification (PAC), which reflects the percentage of cases that can be correctly classified as “no” preference of public transport with the independent variables added (not just the overall model).

Sensitivity, which is the percentage of cases that had the observed characteristics, “yes” for private public transport preference, which were correctly predicted by the model.

Specificity, which is the percentage of cases that did not have the observed characteristic, “no” for preference of private transportation and were also correctly predicted as not having the observed characteristic that is true negatives.

The positive predictive value, which is the percentage of correctly predicted cases “with” the observed characteristic compared to the total number of cases predicted as having the characteristic.

The negative predicted value, which is the percentage of correctly predicted cases “without” the observed the observed characteristic compared to the total number of cases predicted as having the characteristic.

Dependent Variable Encoding:

Table 3:- Dependent Variable Encoding (college).	
Original Value	Internal Value
Yes	0
No	1

Table 4:- Dependent Variable Encoding (high school).	
Original Value	Internal Value
Yes	0
No	1

Source: collated from field work:

Encoding of variable is done where the answer ‘Yes’ is coded a numerical value ‘0’, the answer ‘No’ is coded a numerical value ‘1’. Encoding is done in a similar manner for evaluation in both the college and high-school teacher respondents. The Dependent Variable Encoding table 3 & 4 shows how the outcome variable was coded, if it was coded. The outcome variable represented responses yes and no, then the left column (Original Value) shows the associated value labels, 'yes' and 'no' while the right column (Internal Value) would show the values 0 and 1 for each. By default, the binary logistic regression predicts the odds of membership in the outcome category with the highest value; here predicting membership in the 1 value, as opposed to membership in the 0 value.

Chi- Square:

Table 6.Omnibus Tests of Model Coefficients (high school)				
		Chi-square	Df	Sig.
Step 1	Step	131.797	5	.000
	Block	131.797	5	.000
	Model	131.797	5	.000

Table 5 .Omnibus Tests of Model Coefficients (college)				
		Chi-square	Df	Sig.
Step 1	Step	123.912	6	.000
	Block	123.912	6	.000
	Model	123.912	6	.000

Source: collated from field work:

The Chi Square Test is used to collae the expected frequency and the observed frequency. The Omnibus Tests of Model Coefficients table reports the chi-square associated with each step in a stepwise model. Here, there is only one step from the constant model to the block containing predictors so all three values are the same. The

significance value or *p*-value indicates our model (Block 1; with predictors) is significantly different from the constant only model; meaning there is a significant effect for the combined predictors on the outcome variable.

The Chi- Square value is 123.912 and is highly significant at (.000) as seen in the table 5 for the college teacher respondents. The individual variables are analyzed through the interpretation of the Logit model.

The Chi- Square value is 131.797 and is highly significant at (.000) as seen in the table 6 for the high school teacher-respondents.

Goodness of Fit:

Table 7:- Model Summary (college).

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	15.268 ^a	.644	.938
a. Estimation terminated at iteration number 20 because maximum iterations have been reached. Final solution cannot be found.			
Table 8:- Model Summary (high school).			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	14.811 ^a	.667	.94

Estimation terminated at iteration number 20 because maximum iterations have been reached. Final solution cannot be found.

Source: collated through field work

The two *R*, *Cox & Snell* and *Nagelkerke R Square* estimates are not truly *R* estimates; they are pseudo-*R*; meaning they are analogous to *R* in standard multiple regression, but do not carry the same interpretation. They are not representative of the amount of variance in the outcome variable accounted for by all the predictor variables. The Nagelkerke estimate is calculated in such a way as to be constrained between 0 and 1. So, it can be evaluated as indicating model fit; with a better model displaying a value closer to 1. The larger Cox & Snell estimate is the better the model; but it can be greater than 1. These metrics should be interpreted with caution and although not ignored, they offer little confidence in interpreting the model fit.

Under the Model Summary, we see that the -2 Log Likelihood statistics is 15.268 for the college teachers. This statistic measure how poorly or efficiently the model predicts the decisions-the smaller the statistic, the better the model. The Cox & Snell R square can be interpreted like R Square in a multiple regression but cannot reach a maximum value of 1. The Nagelkerke R Square can reach a maximum of 1.

The Nagelkerke R Square depicts the goodness of fit as seen in Table 7. It denotes the variation in dependent variable due to independent variable. In this case R square=0.938. Therefore 93.8% of variation of dependent variable can be explained with the independent variables. The factors included in the model account for 93.8% of the variation for the Nagelkerke while Cox & Snell explained 64.4%.

In table 8, we see that the -2 Log Likelihood statistics is 14.811 for the high school teacher respondents. The Nagelkerke R Square depicts the goodness of fit as seen in Table 8. It denotes the variation in dependent variable due to independent variable. In this case R square=0.945. Therefore 94.5% of variation of dependent variable can be explained with the independent variables. The factors included in the model account for 94.5% of the variation for the Nagelkerke while Cox & Snell explained 66.7%.

Interpretation of the Logit model:

In order to establish the relationship between the dependent and independent variables, the following table is used

Variables in the Equation:**Table 9:-** Variables in the Equation (college).

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	gender(1)	.027	1.605	.000	1	.987	1.027
	Time related issues	-.5485	1.525	12.942	1	.000	.004
	comfort level	-.21372	6196.255	.000	1	.997	.000
	Accessibility&flexibility	-.3219	1.716	3.519	1	.061	.040
	saves money	-.16335	14201.854	.000	1	.999	.000
	Otherreasons	-.19572	40192.970	.000	1	1.000	.000
	Constant	3.827	1.569	5.949	1	.015	45.918

a. Variable(s) entered on step 1: gender, time issues, comfort level, accessibility& flexibility, saves money, otherreasons.

Table 10:- Variables in the Equation (high school).

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1 ^a	gender(1)	.417	1.582	.069	1	.792	1.517
	Timerelatedissues	-3.257	1.659	3.853	1	.050	.039
	comfort level	-.19303	12270.892	.000	1	.999	.000
	accessibility & flexibility	-5.219	1.555	11.259	1	.001	.005
	Money-saving	-.19757	5387.135	.000	1	.997	.000
	Constant	3.701	1.536	5.802	1	.016	40.484

a. Variable(s) entered on step 1: gender, time_related_issues, comfort level, accblty_flexblty, money-saving.

The Variables in the Equation tables (above), shows the logistic coefficient (B) for each predictor variable. The logistic coefficient is the expected amount of change in the logit for each one unit change in the predictor. The logit is what is being predicted; it is the odds of membership in the category of the outcome variable with the numerically higher value (here a 1, rather than 0). The closer a logistic coefficient is to zero, the less influence it has in predicting the logit. The table also displays the standard error, Wald statistic, *df*, Sig. (*p*-value); as well as the Exp (B) and confidence interval for the Exp (B). The Wald test (and associated *p*-value) is used to evaluate whether or not the logistic coefficient is different than zero. The Exp (B) is the odds ratio associated with each predictor. We expect predictors which increase the logit to display Exp (B) greater than 1.0, those predictors which do not have an effect on the logit will display an Exp (B) of 1.0 and predictors which decrease the logit will have Exp (B) values less than 1.0. Note that the Exp (B) is wildly large for the x3 predictor. This is due to a combination of the strong relationship between that variable and the outcome variable; and the fact that x3 is nearly categorical itself. Generally, when using continuous variables as predictors, you will not see such large Exp (B). The Wald test ("Wald" column) is used to determine statistical significance for each of the independent variables. The statistical significance of the test is found in the 'Sig' column. Based on the level of significance (sig.) and the intercept values (B) as seen in table. The

regression equation is formed. If the significance level is lesser than 0.05, then the variable is highly significant. We can use the information in the “variables in the Equation” table to predict the probability of an event occurring based on a one unit change in an independent variable when all other independent variables are kept constant

Specific to College teacher respondents, table 9 shows that the odds of preferring private over public transportation (“yes” category) is 1.027 times greater for males as opposed to females. Time issues, has a negative result on the dependent variable (-5.485), but is highly significant (.000). This means that a unit increase in time issue as a factor will lead to a 5.485 decrease in the dependent variable. This reveals that time issue in relation to transportation is highly significant to the choice of means of transportation. The estimated co-efficient for time issue came out negative, implying that an increase in issues related to time management and related issue as a whole, was likely to decrease the use of public transport. Flexibility and accessibility, has a negative result on dependent variable (-3.228), but is highly significant (.047). This means that a unit increase in flexibility and accessibility as a factor will lead to a 3.228 decrease in the dependent variable. This reveals that Flexibility and accessibility, in relation to transportation is highly significant to the choice of means of transportation. The estimated co-efficient for time issue came out negative, implying that an increase in issues related to Flexibility and accessibility as a whole, was likely to decrease the use of public transport. From these results, we can see that factors such as Time-related issues (0.050) and Accessibility & Flexibility (0.001) added significantly to the model/prediction, but Gender (.792) and Money saving (.997) as a factor did not add significantly to the model.

Specific to high school teacher respondents, based on the level of significance (sig.) and the intercept values (B) as seen in table 10. The table 10 shows that the odds of preferring private over public transportation (“yes” category) is 1.517 times greater for males as opposed to females among high school teacher respondents. Time issues, has a negative result on the dependent variable (-3.257), but is highly significant (.050). This means that a unit increase in time issue as a factor will lead to a 3.257 decrease in the dependent variable. This reveals that time issue in relation to transportation is highly significant to the choice of means of transportation. The estimated co-efficient for time issue came out negative, implying that an increase in issues related to time management and related issue as a whole, was likely to decrease the use of public transport. Flexibility and accessibility, has a negative result on dependent variable (-5.219), but is highly significant (.001) this means that a unit increase in flexibility and accessibility as a factor will lead to a 5.219 decrease in the dependent variable. This reveals that Flexibility and accessibility, in relation to transportation is highly significant to the choice of means of transportation. The estimated co-efficient for time issue came out negative, implying that an increase in issues related to Flexibility and accessibility as a whole, was likely to decrease the use of public transport. From these results, we can see that factors such as Time-related issues (0.050) and Accessibility & Flexibility (0.001) added significantly to the model/prediction, but Gender (.792) and Money saving (.997) as a factor did not add significantly to the mode

Findings:

Findings of analysis of econometric models in relation to college teacher’s modal choice:

The binary logit model shows that, of the variables affecting transport mode choice by college teachers, the most significant is time issues; secondly, accessibility and flexibility of the private transportation which was also observed in the preceding sections of the chapter. The small sample size, with little variability across the quantitative variables could be the reason of the low significance, yet high odd ratios.

The dependent variable used to run the regression model is the choice of means of transportation used. Therefore, the individuals’ decision in preferring private over public transportation is dependent on certain explanatory variables which are gender of the respondents, time issue (bus service time and time of travel), comfort level (security, comfort and independence of private vehicle, crowdedness of bus and likeness for driving), accessibility and flexibility (inconvenience due to access distance of bus stops, public transportation networks limitations), cost saving (taxi fares), and lastly other factors, given as others for the respondents to specify. Certain variables have been dropped to avoid multicollinearity (Dropping Variable Method).

The Nagelkerke R Square depicts the goodness of fit. It denotes the variation in dependent variable due to independent variable. In this case R square=0.938. Therefore 93.8% of variation of dependent variable can be explained with the independent variables. The factors included in the model account for 93.8% of the variation for the Nagelkerke while Cox & Snell explained 64.4%.

Based on the level of significance (sig.) and the intercept values (B), the regression equation is formed. If the significance level is lesser than 0.05, then the variable is highly significant. Time issues, has a negative result on the dependent variable (-5.485), but is highly significant (.000). This means that a unit increase in time issue as a factor will lead to a 5.485 decrease in the dependent variable. This reveals that time issue in relation to transportation is highly significant to the choice of means of transportation. The estimated co-efficient for time issue came out negative, implying that an increase in issues related to time management and related issue as a whole, was likely to decrease the use of public transport. Flexibility and accessibility, has a negative result on dependent variable (-3.219), but is highly significant (.061). This means that a unit increase in flexibility and accessibility as a factor will lead to a 3.219 decrease in the dependent variable. The binary logistic model demonstrated that the most significant variable affecting the commuter's mode choice is the time issue-factor. The other factor being the Flexibility and accessibility factor; The estimated co-efficient for time issue came out negative, implying that an increase in issues related to Flexibility and accessibility as a whole, was likely to decrease the use of public transport.

Findings of analysis of econometric models in relation to high school teacher's modal choice:

The logit model shows that of the variables affecting transport mode choice by high school teachers that is most significant is time issues; secondly, accessibility and flexibility of the private transportation which was also observed in the preceding sections of the chapter. The small sample size, with little variability across the quantitative variables could be the reason of the low significance, yet high odd ratios.

The dependent variable used to run the regression model is the choice of means of transportation used. Therefore, the individuals' decision in preferring private over public transportation is dependent on certain explanatory variables which are age of the respondents, time issue (bus service time and time of travel), comfort level (security, comfort and independence of private vehicle, crowdedness of bus and likeness for driving), accessibility and flexibility (inconvenience due to access distance of bus stops, public transportation networks limitations), cost saving (taxi fares), and lastly other factors, given as others for the respondents to specify. Certain variables have been dropped to avoid multicollinearity (Dropping Variable Method).

The Nagelkerke R Square depicts the goodness of fit. It denotes the variation in dependent variable due to independent variable. In this case R square=0.945. Therefore 94.5% of variation of dependent variable can be explained with the independent variables. The factors included in the model account for 94.5% of the variation for the Nagelkerke while Cox & Snell explained 66.7%.

Based on the level of significance (sig.) and the intercept values (B), the regression equation is formed. If the significance level is lesser than 0.05, then the variable is highly significant. Time issues, has a negative result on the dependent variable (-3.257), but is highly significant (.050). This means that a unit increase in time issue as a factor will lead to a 3.257 decrease in the dependent variable. This reveals that time issue in relation to transportation is highly significant to the choice of means of transportation. The estimated co-efficient for time issue came out negative, implying that an increase in issues related to time management and related issue as a whole, was likely to decrease the use of public transport. Flexibility and accessibility, has a negative result on dependent variable (-5.219), but is highly significant (.001) this means that a unit increase in flexibility and accessibility as a factor will lead to a 5.219 decrease in the dependent variable. This reveals that Flexibility and accessibility, in relation to transportation is highly significant to the choice of means of transportation. The estimated co-efficient for time issue came out negative, implying that an increase in issues related to Flexibility and accessibility as a whole, was likely to decrease the use of public transport. The binary logistic model demonstrated that the most significant variable affecting the commuter's mode choice is the Flexibility and accessibility factor. The other factor being the time issue-factor; The estimated co-efficient for time issue came out negative, implying that an increase in issues related to Flexibility and accessibility as a whole, was likely to decrease the use of public transport.

Conclusion:-

Careful analysis also shows that the respondents prefer private transportation to public. The logit model shows that of the variables affecting transport mode choice by individual among high school teachers that is most significant is accessibility and flexibility of the private transportation. Also the variables affecting transport mode choice by individual among college teachers that is most significant is time issues; secondly, accessibility and flexibility of the private transportation which was also observed in the preceding sections of the chapter. The small sample size, with little variability across the quantitative variables could be the reason of the low significance, yet high odd ratios.

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