Model Selection of Seller Travel Modeat Traditional Market in Makassar City

Aria Syamsu Rizal, M. Isran Ramli, Mubassirang Pasra

Abstract: ***The large number of sellers in traditional markets will result in a significant amount of movement and traffic volume around the market. Based on this, the authors consider that it is necessary to analyze the model of traditional market seller travel mode in the traditional markets. The traditional markets that are the target of the research are the NiagaDaya Market, Terong, Panampu, Maricaya and Pa'baeng-baeng. These markets are used as objects of research because they represent the other markets. The time of the research was carried out in the market operating hours in the morning until evening (7.30-16.00) for 7 days. The key results have shown that, respondents adhere to the three modes of transport (motorcycles, public transportation and cars). The average probability value for the overall mode selection of traditional markets is for shop owner respondents who have a tendency to choose motorbike mode of 83.65%, 14.96% for choosing car mode and 1.39% for choosing public transportation mode.***

Keywords: ***Seller travel, Traditional markets, Traffic volume, Transport.***

I. INTRODUCTION

Mode selection problems can be said as stages most important in various transportation planning and policies [1]. This concerns the efficiency of movement in urban areas, the space that the city must provide to be used as transportation infrastructure and the many modes of transportation that can be chosen by the population [2].

Fulfillment of needs is an activity that usually has to be carried out every day, for example fulfilling the need for work, where not all of these needs are available around the residence but are usually spread heterogeneously in accordance with the land use, so that it requires good movement without modification transportation (short distance between 1 - 2 km) and with modes of transportation (medium - far distance) [3,4]. While the type of transportation mode used is also very diverse such as private or public vehicles[5-8]. Makassar is a metropolitan city which is the capital citythe province of South Sulawesi undoubtedly has such rapid development in various fields [9].

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The Makassar City Government has tried to fulfill all the demands of its people; one of the government's efforts to meet the demands of the community is to provide a variety of adequate public facilities [10]. One of the public facilities provided by the government is the traditional market, which is used by people for buying and selling activities of goods or services. The number of local markets at Makassar reached more than 50, where 16 markets including the city government are categorized as official traditional markets and 34 markets or the rest are labeled as traditional emergency or wild markets [11].

The traditional markets that are the target of the research are the NiagaDaya Market, Terong, Panampu, Maricaya and Pa'baeng-baeng. These markets are used as objects of research because they represent the other markets. The large number of sellers in traditional markets will result in a significant amount of movement and traffic volume around the market. Based on this, the authors consider that it is necessary to analyze the model of traditional market seller travel mode in the traditional markets.

II. METHODOLOGY

Research Location and Time

The research was carried out on 5 traditional markets located in Makassar City, namely Daya Market, Terong Market, Panampu Market, Maricaya Market, and Pabaeng-baeng Market as the target of research with the object of research are kiosk owners in traditional markets.The time of the research was carried out in the market operating hours in the morning until evening (7.30-16.00) for 7 days, and will continue if there are data that are considered insufficient or do not meet the requirements.

Population and Samples

The populations in the study are sellers in traditional markets in the city of Makassar.Simple Random Sampling method was used on owners and employees of traditional markets in the city of Makassar as sampling method.

Data Collection

Technique of data collection, survey technique with interview was utilized for data collection. The type of research carried out is in the form of a survey with the survey state preference method. The survey was conducted by distributing questionnaires that function to collect data from kiosk owners and employees in traditional markets.

Research Variables

The choice of mode is related to the behavior of the traveler in determining the mode of transportation used; this is highly dependent on the value of the utility that the traveler gets. The utility value of the tripper is different for each person. So the variable used in this study consists of two parts, namely the demand and supply variables. The variable demand consists of income, age and sex factors. The supply variable consists of travel time, travel costs, and the level of transportation mode services. These variables are then used in the preparation of questionnaires that will be used in the study.

Data Analysis Method

Multinomial logic regression model is a model used to analyze data in research on modal selection in this traditional market. To find the factors that influence the selection, the likelihood ratio test (simultaneous) and Wald test (partial) are used. Of the two categories of modal user respondents, shop owners and employees, the variables considered to be the most influencing respondents in choosing modes are travel distance, transportation costs, and travel time. Variable name for distance (distance | X1), transportation cost (cost | X2), for travel time (time | X3). The assumptions underlying the retrieval of variables in mathematical modeling are:

a. The trip that is carried out is a trip to work, so that the distance, cost and time factor, can be considered as the determining factor in the smooth running of the trip in relation to choosing the mode. Besides these three types of variables are owned by both categories of respondents.

b. Variable distance, cost, and time, can be used as a reference in taking internal policies (market managers) and external policies (by the local government).

c. Mode selection is one model of the Four-Stage Model in transportation, so the resulting model can be useful if the model will be combined with other models that generally have distance, cost, and time variables.

The estimation method used is the Maximum- Method Likelihood with observation categories of owners and shop employees conducted on five observation locations including Pabaengbaeng market, Panampu market, Daya market, Maricaya market and Terong market.

III. RESULT AND DISCUSSION

From the estimation results in Table 1, we can see that it is in the choice of mode of transportation in the rice market is that the time variable for the category of shop owners and shop employees has considerable significance. Whereas for odds ratio parameters we can interpret that, for the shop owner category if the cost and time parameters are fixed as before, it is likely that the respondent chooses an angkot equal to 0.0003 compared to a motorbike and it is likely that the respondent chose a car at 0.0013 compared to a motorbike.

For variable odds ratio on cost and time for the category of shop owner, it can be interpreted that although there is an increase in the cost of one unit (Rp. 1000) for motor mode, it will only increase the likelihood of choosing that mode by 1.004 (0.4%) and even though there is an increase in time one unit (1 Minute) for motor mode will only increase the probability of modal selection by 1,024 (2.4%). Interpretations for store employees and other observation locations are similar to these interpretations.

Table. 1 Maximum Likelihood Market Observation estimation results

Location	Category		Public Transport	Private Car	Transport x Distance	Car x Distance	Cost	Time
					X1	X2	X3	X4
		Coeff	-8.1193	-6.6828	-0.0007	0.0000	0.0044	0.0239
Pabaeng	Owner	Odd ratio	0.0003	0.0013	0.9993	1.0000	1.0044	1.0242
		Coeff	-1.0861	-113.2133	0.000	0.0054	0.0244	-9.3435
	Employee	Odd ratio	0.3375	0.000	1.0000	1.0055	1.0247	0.001
Panampu		Coeff	-2.7750	-7.8568	0.0022	0.0198	-0.0017	-0.4401
	owner	Odd ratio	0.0623	0.0004	1.0022	1.0200	0.9983	0.6440
		Coeff	-9.6444	0.0000	0.0001	0.0000	-0.0061	-9.3435
	Employee	Odd ratio	0.0001	0.0000	1.0001	0.0000	0.9939	0.0001
Daya		Coeff	-8.5114	-7.2218	-0.0008	0.0000	0.0048	0.0235
	owner	Odd ratio	0.0002	0.0007	0.9992	1.0000	1.0048	1.0238
		Coeff	64.4755	0.0000	-0.0132	0.0000	-0.007	-9.3435
	Employee	Odd ratio	1E+28	0.0000	0.9869	0.0000	0.9993	0.0001
Maricaya		Coeff	-2.5803	-4.8710	0.0000	0.0013	0.0002	-0.6704
	owner	Odd ratio	0.0758	0.0077	1.0000	1.0013	1.0002	0.5115
		Coeff	36.5307	0.0000	-0.00235	0.0000	-0.0460	-9.3435
	Employee	Odd ratio	7.33E+15	0.0000	0.9768	0.0000	0.9550	0.0001
Terong		Coeff	-2.8564	0.5519	0.0001	0.0001	-0.0006	0.1081
	owner	Odd ratio	0.0574727	1.736583	1.000075	1.000067	0.9994011	1.114204
		Coeff	-14.2816	41.58007	-0.00343	-0.023807	0.0102743	-9.343453
	Employee	Odd ratio	0.000000627	1.14E+18	0.9965761	0.9764747	1.010327	0.000875

From the probability predictions for the whole Conditional-Logit is shown in Table 2. In the table it can be seen that motorbikes at all observation locations are still a mode with the highest probability of use. For the category of shopkeepers and shop owners, the lowest probability is 65%, and even then it is still in a large enough categories when compared to the probability of using the mode to travel from and to the traditional market.

Table. 2 Probability of mode selection

Location	Category	Probability of Modal Selection (%)			Total
		Transport	Car	Motorcycle	(%)
PabaengBaeng	Shop owner	0.15%	31.31%	68.55%	100%
	Shop employee	25.65%	0.0001%	74.35%	100%
Panampu	Shop owner	0.314%	0.0001%	99.686%	100%
	Shop employee	0.087%	0.000%	99.913%	100%
Daya	Shop owner	0.112%	31.321%	68.567%	100%
	Shop employee	14.231%	0.000%	85.769%	100%
Maricaya	Shop owner	4.02%	1.41%	94.58%	100%
	Shop employee	25.65%	0.00	74.35%	100%
Terong	Shop owner	2.36%	10.78%	86.86%	100%
	Shop employee	15.38%	0.93%	83.69%	100%
Shop owner		1.39%	14.96%	83.65%	100%
Shop employee		16.20%	0.19%	83.62%	100%

The overall model test (seen in output Data), is done by looking at the value (prob> chi2) which is a probability value that refers to the Likelihood-Ratio2 (LR-chi2) statistical test as extreme, or more, than observed in Zero hypothesis. The zero-hypothesis is that all regression coefficients in the model simultaneously equal to zero. (H0: $\beta x = 0$, H1: $\beta x \neq 0$). The Stata estimation results for this test, provide values (Prob> chi2 = 0.0000) for each category of respondents, so that it can be said that the shop owner model and shop clerk (for the overall model test), can be accepted with a significance level of 0.05, and 0.01 (Prob> chi2) or successfully reject Ho.

There is a wide variation of pseudo-R2 statistics. Maddala, 1983 (in Long, Freese, 2001) explains that pseudo-R2 values are generally not a measure for the perfect-fit model, because the value is smaller than 1, and sometimes can be so small. Pseudo-R2 values from the estimation results and Likelihood ratio are shown in Table 3.

Table. 3 Likelihood ratio and pseudo R2 observations

Observation Location	Shop Owner		Shop Employee	
	Prob>chi2	Pseudo R^2	Prob>chi2	Pseudo R^2
Pabaeng	0.000	0.3592	0.000	0.4146
Panampu	0.000	0.8766	0.000	0.6015
Daya	0.000	0.3592	0.000	0.2091
Maricaya	0.000	0.657	0.000	0.519
Terong	0.000	0.5822	0.000	0.5564

IV. CONCLUSION

Thus, based on the work done, the key results has shown that, probability predictions from the Stata program, provide a probability value for each category of respondents to the three modes (motorcycles, public transportation and cars). The average probability value for the overall mode selection of traditional markets is for shop owner respondents who have a tendency to choose motorbike mode of 83.65%, 14.96% for choosing car mode and 1.39% for choosing public transportation mode. Whereas for shop employee respondents, it has a tendency to choose motorcycle mode 83.62% 0.19% choose car mode and 16.20% choose public transportation mode.

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