Characteristic and Moda Choice of Inter City Traveling in The Provinces. (Case Study: AKDP Traveling Trough The Road Axle of Makassar-Parepare, South Sulawesi)

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Abstract

Inter city transportation is a transportation that connects a city with other cities whether in a province of administration region or in other provinces. AKDP services are performed in network routes and road infrastructure undertaken as listed has been set in the route permission.

There are different types of transportation modes that serve the Makassar and Pare-pare route and have permission-routes, such as Damri transportation, Mini-Buses, BMA and MPU vehicle (Panther, Kijang, Avanza etc.). Each of these transportation modes has its advantages and disadvantages, so there are many alternatives to select the transportation mode that will be used in the route, by looking at all the mode attributes.

The purpose of this research is to analyze the characteristics of the passenger trip as well as the selection of inter regional traveling mode in the provinces (AKDP) of Makassar-Parepare route. The analysis methods used is Multinomial Logit model based utility models.

The analysis results that obtained form the characteristic and selection of transportation mode with the largest percentage is by using MPU transportation mode type (32%), male and aged between 15-25 years, as a student with the intention of family traveling.

Keywords: Traveling characteristics; mode choice; AKDP; and multinomial logit.

1. Introduction

1.1 The Problem Background

Makassar city is one of the major cities in Indonesia that continue to undergo rapid development from year to year, the developments are caused by the increasing population in Makassar and Makassar's position as a center of economic development and as educational city in Eastern Indonesia became the factor of population urbanization process which resulted in an increasing of population numbers and of course have an impact on increasing of people and goods transport especially inter regional within the province.

Inter regional transportation is a transportation that connects a city with other cities whether in one administration region province, between cities in the provinces (AKDP), or in the other provinces. AKDP services perform in the network routes and organized with discrete service, i.e. the availability of passenger terminal at least type B at the beginning of the departure, stopover, and terminal destination, as well as road infrastructure undertaken as listed in the route permission that has been set.

In an inter regional movement, factor selection mode is a very important role, a person who will travel from one city to another certainly consider many things, whether he would use his private vehicles or would use public transportation, there are many selection of transportation mode that may be used [Rahman R., 2009].

In spite of the transportation mode that serves the Makassar-Parepare route, there are different types of transportation modes such as Damri buses, mini-buses, panther, kijang, etc. Each of these transportation modes has its advantages and disadvantages, so the selection of the transportation mode used of course based on the fact that the traveler has a number of specific reasons and considerations to determine the mode that will be used by looking at all the mode attributes.

Parepare town is one of the largest towns in South Sulawesi besides Makassar and also is one of the destination city for AKDP public transportation users. The distance between the Makassar city and Parepare town is approximately ± 155 km and passes through several districts such as Maros, Pangkep, Barru till Parepare. AKDP mobility of Makassar-Parepare routes is regarded dense due to the high demand of passengers to use the routes AKDP of Makassar-Parepare routes by diversed reasons and interests.

The problem that arises is lacking the proper functioning of the terminal's role as a place to load and drop the passengers or goods and the arrival place and port setting of public transportation. Because of the level of terminal services that are not optimally utilized as appropriate, make the other side took the opportunity by making "wild terminal" around Regional Terminal of Daya'. Consequently, many of the minibus that was reluctant to get into the terminal to pick up and drop passengers, Finally, AKDP transportation particularly Public Passenger Car (MPU) takes charge outside the terminal which resulted in the AKDP passengers chose to wait at the roadside rather than come into the terminal so that it can be seen along the Jalan Perintis Kemerdekaan to the border of Makassar that a number of recruit passengers is lined up waiting for the transportation.

In the meantime a number of operators or AKDP transportation companies which makes base/pool in Makassar city such as Buses Damri vehicles are located on Jalan Toddopuli and pool of BMA Bus in jalan Gunung Bawa Karaeng, perform their own departures at the base/pool vehicles. They pay retribution to the terminal for their vehicles but does not through the terminal making a lot of AKDP public transportation users in Makassar will no longer have to enter to await at the terminal of departure transportation.

1.2. Research objectives

A series of this research activities aims to analyze the characteristics of the passenger trip as well as the selection of inter regional traveling mode in the provinces (AKDP) of Makassar-Parepare route. The analysis methods used is Multinomial Logit model based on Utility models.

1.3. Transportation system of Public transportation

In organizing of the public transport system, there are some related parties, namely the user, entrepreneurs (operator) and the Government (the regulators). Each party has its own interests and policies that can accommodate all party accordance with the functions, rights and obligations that contained in a regulation or legislation. The role of each related party is as follows [Siswoyo M. P., 2008]:
- Operator (businessman) is the party that concentrates in the operation of public transport systems and carry out everyday decisions with regard to the specific characteristics of the conditions of

service, such as scheduling, the determination of the limit of the operations and maintenance fleet.

- User is the party that actually made the decision during a trip on public transportation system, owing to the magnitude of the cost that they spend on traveling (fare) and other costs (intangibles) are not measured by monetary value, such as waiting time, distance and travel time.
- Regulators (Government) is the party that controls the interaction between operator and user. The Regulator who reviews the system performance in operational techniques and financial economic as well as to provide specifications for provision and operation of public transportation systems. This regulatory policy is what being a benchmark for the level of services provided by public transport supply.

Transportation is used to facilitate human in performing daily activities. Transportation is an attempt to transfer, move, transport or shift an object from one place to another by using a vehicle that is driven by human or machine, which the places are more useful or can be usefor certain purposes [Miro, 2005].

1.4. Mode choice model

As an island nation, Indonesia in its development is really need an transportation with various modes so that the transportation plans need a modeling technique that can involve several types of modes. Modeling techniques that are currently available are often only involved one mode. If the mode is used more than one times it is usually performed in separate stages (selection mode) or equivalents (distribution/selection mode) without changing the representation network [Ortuzar and Willumsen, in Budi Prasetyo, l. Bambang-2000].

The model of selection mode is aimed to know the proportion of people who will be using every mode. This process is conducted with the intent to calibrate the model of selection mode in basic year by knowing non variables that affect the selection mode or by knowing the attributes and variables that affect the preference of user for the selection the mode. The selection mode is also very influenced by: demand variables that is related to the user socio-economic condition to travel and supply variables that are related to level of service provided by the mode of transportation [Sebayang S., 2001].

1.5. Affecting Factors of Mode choice

There are several factors that influence the selection modes i.e. as described below [Miro, 2005]:

a. Characteristics of traveling (Travel characteristic factor) variables that are considered to be influenced in the choice of mode, that is the purpose of traveling (go to work, school, social, etc.), traveling time (morning, noon, afternoon, holidays and so on) and the length of the trip (the distance between the origin and destination, the time comparison when using other modes).

b. Characteristics of the trip perpetrators (Traveler characteristic factor) several variables that are considered to affect, namely income, ownership of vehicles, private vehicle condition (old, ugly, new, and so forth), the density of settlement and socio-economic (e.g., family/household structure, age, gender, type of work, location of work, possession of a driving license (SIM), and so on).

c. The characteristics of the transportation system (Transportation system characteristic factor) variable that affects is traveling time (length of time waiting at arriving place/terminal, running time to arriving place, time during the mode moves, and so forth), traveling costs (fares/rates, fuel costs, parking fees), level of service (service levels is difficult to measure and varies, i.e. include comfort and pleasure variables that makes people easy to change the transportation), level of access/easiness of attainment/destination and the level of reliability of public transportation (in terms of punctuality), the availability of parking spaces and rates.

d. The characteristics of the city and zone (Special characteristic factor) variables that are included affecting is settlement distance to the activity places (CBD) and population density.

2. Research Methods

The implementation of the research is performed to public transportation trip of Makassar-Makassar route, where Makassar as a center of the movement. Data retrieval Methods are placed at the departure location in Regional Terminal of Daya', wild terminal in some points of the departure location along the road of Jalan Perintis Kemerdekaan to the border of Makassar, and at base/pool of public transportation in Makassar.

Fig. 1. Moda Bus Damri, Mini Bus, BMA and MPU

Based on the survey results, the transportation mode type on the study area of Makassar-Parepare route is differentiated into 4 types of vehicles including:
- Damri Buses Vehicle (BD), with transport capacity is 49 seat
- Mini Bus Vehicle (MB), with transport capacity is 28 seat
- BMA car with transport capacity is 9 seat
- Public transportation car (MPU), Panther, Kijang, Avanza, etc., with transport capacity is 8 seat.

Population is the collection of objects that is examined. Population is not only just the number that exists on the object/subjects are studied but also covers the whole characteristics/properties that is owned by the object/subject [Sugiono, 2009]. In this study the population is all over the transportation modes users of Makassar-Parepare by calculating the number of passengers per day for each mode where the observations is conducted during a week.

Sample is a subset of the number and characteristics of which are owned by the population. Mathematically, the size of samples from a population is small or smaller than 10,000 can be formulated as follows:

The data collection method is carried out by three ways i.e., observation, interview and questionnaires that are distributed to passengers on inter regional public transport where the methods is analyzed by the multinomial logit model

$$n = \frac{N}{1 + Nd^2} \qquad (1)$$

3. Results and Discussion

3.1. Characteristics of the mode choice

Based on the analysis results, the characteristics of the selection mode with the number of respondents are 1064 people, obtained percentage of people who choosing Damri Buses is 308 people respondents (29%), Mini Bus is 276 people respondents (26%), BMA Bus is 142 people (13%) and passenger cars (MPU) and public passenger car is 336 people respondents (32%), where the highest mode percentage option is MPU vehicle type as the following table:

Table 1. Distribution of moda choice

Type of moda	Total passenger (people)	Total passenger (%)
Bus Damri	308	29
Mini Bus	276	26
Bus BMA	142	13
MPU	338	32
Total	1064	100

One factors that causing many passenger who choosing MPU transportation compared to other types of vehicles is caused by the number of this vehicle type which operate every day. Therefore the MPU departure time is any time if compared to the types of Damri bus and the BMA vehicle hat have to wait departure schedule or wait until the vehicle is fully loaded such as mini buses. Meanwhile the lowest mode option is the type of BMA Bus vehicle. The factors that cause these are low passengers who choose this type of vehicle is likely due to factors of a very expensive price when compared to other vehicles.

3.2. Traveling characteristics

The characteristics of the AKDP passenger trip of Makassar-Parepare describes the transportation that is used and the reasons for using such type of transportation, travel intentions, distance range forecasts from home to the terminal/pool, distance range forecasts from Makassar to Parepare destination, traveling time forecast from home to the terminal/Pool, traveling time forecasts from Makassar to Parepare destination, costs forecast from home to the terminal/AKDP Pool, costs forecast from Makassar to Parepare destination (including transportation rates, eating and drinking during the trip).

• Reasons for using transportation type

Based on the survey and analysis results, the highest reason for choosing a vehicle in traveling is due to the traveling time with a MPU transportation type as many as 93 people from 183 respondents (51%), in second place by the comfort and safety reason of BMA transportation type is as many as 45 people from 103 respondents (43%), and Damri bus is in the third position by traveling costs reason for this mini bus transportation type as much as 67 people from 164 respondents (41%) furthermore for convenience reasons for Damri buses type transportation is as many as 54 people (31%) of 172 respondents (31%), then with the availability of transportation reason is as many as 39 people for MPU transportation is as many as 183 respondents (21%). Last, punctuality reason of departing/arriving for BMA vehicle type is as much as 14 people from 104 respondents (13%).
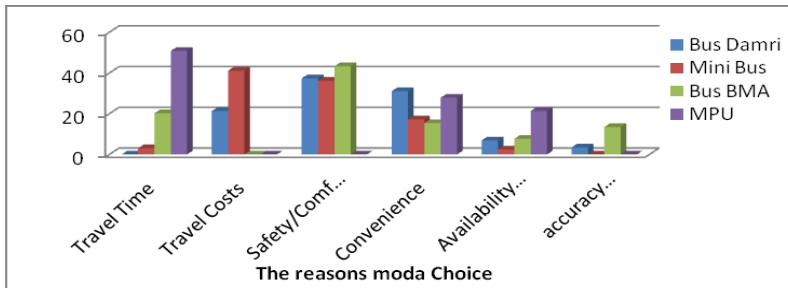
Fig, 2. The reason for using this type of moda

- Traveling Intention

The intention to travel from Makassar to Parepare is mostly by the family purpose of Damri buses transportation type (48%), mini bus (50%) and MPU (49%). While the highest purpose for the BMA transportation type in traveling from Makassar to Parepare is for traveling business/work as much as (40%).
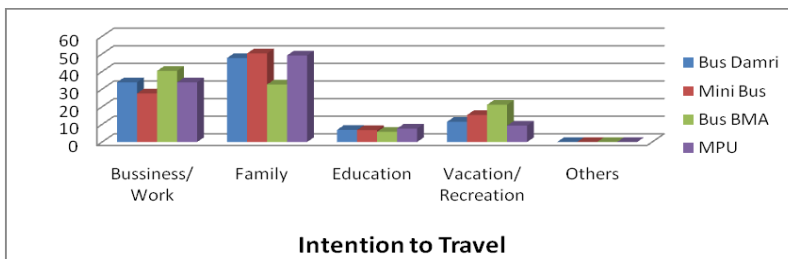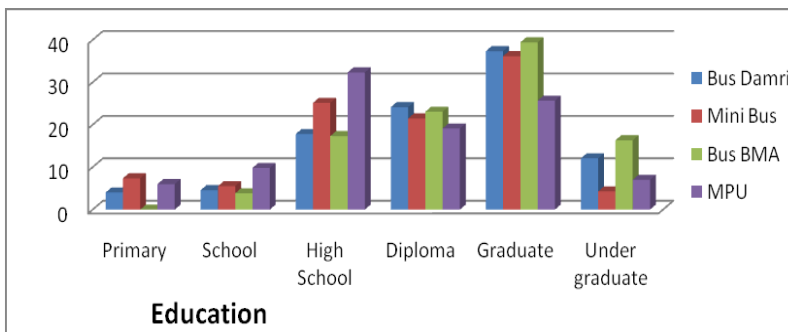

Fig. 3 Traveling intention

- Last Education Level

Respondents with graduate education level (S1) is the most respondents in order to travel from Makassar to Parepare by using Damri Buses (37%), Mini Bus (36%), and the BMA (39%), respondents with high school (SLTA) last education level is mostly using MPU transportation as much as 32%.

- Fig. 4. Last Education Level

• The respondent's occupation

Percentage of respondents using Damri public transport buses and mini buses is mostly working as private employees, i.e. (28%) and (26%), BMA bus is mostly as a businessmans/self-employments (32%) and MPU transportation is mostly students (25%).
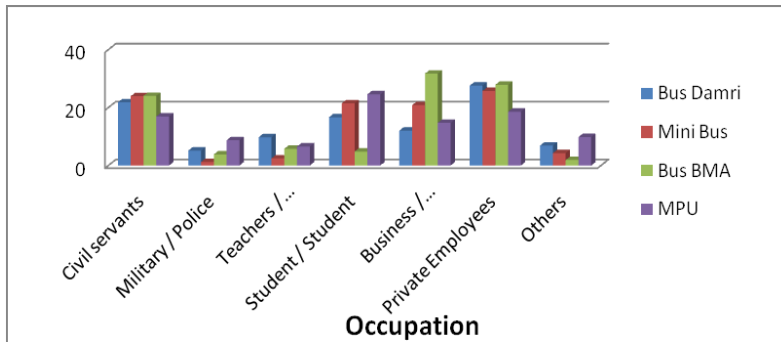

Fig. 5 The respondent's occupation

• The Respondent's average income

From the survey and analysis results are known that the highest respondents' income who traveling is under IDR2000.000,-per-month by using mini-bus public transportation (45%) and MPU (40%). The income is between IDR 2000.000, to IDR 3,500,000,-per-month respectively: by using Damri buses (35%), mini bus (33%) and MPU (33%). Respondents with an income between IDR 3,500,000,- to IDR 5000.000,-per-month are mostly using BMA bus as much as 43%.
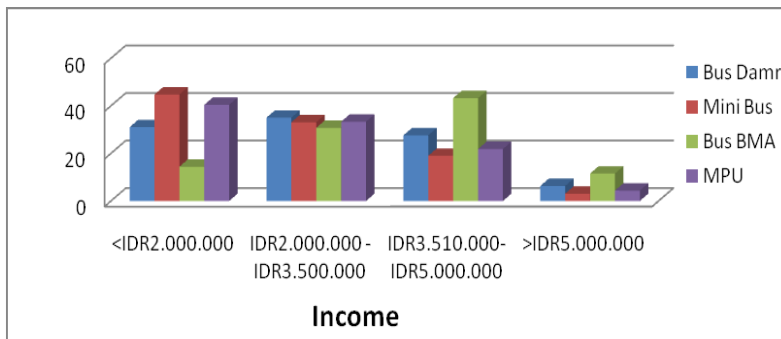

Fig. 6 The Respondent's average income

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