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Evaluation of LRT Jabodebek Tariff with Ability To Pay and Willingness To Pay Methods

Jaka Akbar Mahiranto[a], Farhan Hendro Pratama[a], Abdullah Ade Suryobuwono[a], Abi Prasidi[a]
[a]Faculty of Management and Business, Institut Transportasi dan Logistik Trisakti, Jakarta, Indonesia
Corresponding author: Farhanoke98@gmail.com

Abstract: Currently Jakarta and its surrounding areas such as Bogor, Depok, and Bekasi are filled with motor vehicle congestion every day. The government has tried to overcome this congestion by providing public transportation such as Transjakarta, Commuter Trains, MRT, and what will be discussed in this study is the LRT Jabodebek. The purpose of this study is to determine the Ability to Pay and Willingness to Pay for LRT Jabodebek tariff that has been determined. The research data will be obtained from a sample of 100 passengers obtained using slovin formula and data processed using the ATP and WTP methods. The results of processing data show midpoint value of ATP and WTP is IDR 22.750. These results show that existing tariff IDR 27.400 is still above the ATP and WTP of respondents. The results of this study can be a reference for LRT Jabodebek to evaluate tariffs that have been set.
Keywords*: LRT Jabodebek, Public Transportation, Ability to Pay, Willingness to Pay*

1. Introduction

Although the country's capital will move to the Nusantara in 2024, Jakarta is still the economic center of Indonesia because almost all industrial and economic centers of Java Island are located in Jakarta. According to the Central Bureau of Statistics, the population of DKI Jakarta in 2022 reached 10,679,951 million people. This is in addition to workers who live in buffer areas such as Bogor, Depok, and Bekasi. The volume of roads cannot keep up with the volume of vehicles, making traffic jams like an obligation for residents, more precisely workers who have offices in the Jabodebek area. Therefore, the government through PT KAI provides rail-based public transportation, namely LRT Jabodebek.

The first phase of LRT Jabodebek has a track length of 44.43 kilometers, 17 stations and 2 lines namely Cibubur Line and Bekasi Line. The Cibubur Line connects Harjamukti Station to Dukuh Atas, while the Bekasi Line provides trips from Jati Mulya Station to Dukuh Atas. LRT Jabodebek charges IDR 5.000 for the first kilometer and IDR 700 for each subsequent kilometer. For some people this fare is still considered too expensive, therefore, we conducted this research to find the Ability To Pay and Willingness To Pay of the fare that has been set so that it can be a reference for tariff evaluation by the company and reach or attract more passengers to using LRT Jabodebek.

2. Literature review

2.1. Ability To Pay

Ability To Pay is the ability of the community to pay for the cost of travel (Tamin, Rahman, Kusumawati, Munandar, & Setiadji, 1999). Ability To Pay (ATP) is a person's ability to pay for the services they receive based on their ideal income services he receives based on income that is considered ideal. The approach used in the ATP analysis is based on the allocation of costs for transportation from routine income received. Factors that affect ATP according to (Tamin et al., 1999) are :

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1. Income per month
   Income per month affects ATP, meaning that the greater a person's monthly income will have an impact on the greater ATP because the allocation for mobilization or transportation needs is greater and vice versa.
2. Allocation of transportation costs
   The allocation of costs for transportation affects ATP, meaning that the greater the allocation of costs for a person's transportation, the greater the person's ATP and vice versa.
3. Travel intensity, and
   Travel intensity affects ATP, meaning that the more travel intensity a person has, the more ATP they will have and vice versa.
4. Number of family members
   The number of families affects the amount of ATP of service users, meaning that if the number of families of service users is increasing, it will have an impact on the ATP of the service users themselves due to the possibility of traveling with family members.

2.2. Willingness To Pay

Willingness To Pay (WTP) is the user's willingness to spend services or rewards for the facilities he has received. The approach used in the WTP analysis is based on user perceptions of tariffs and public transportation services (Tamin et al., 1999). According to (Dardela Yasa Guna, 2009) factors that affect the value of willingness to pay (WTP) in the field of transportation include:

1. transportation service products
2. quality and quantity
3. services provided
4. user utility of transportation services and
5. user income

Willingness to pay is the highest price a person (consumer) is willing to pay to get a benefit in the form of goods or services, and makes a benchmark for how much potential consumers value these goods or services. (Dewi, 2016).Willingness to pay is the maximum price of an item that consumers are willing to buy at a certain time (Kim, Kling, & Zhao, 2015).Willingness to pay is actually the price at which the consumer level reflects value, namely the value of goods and services and the sacrifice to get them (Simonson & Drolet, 2003).

2.3. Decree of the Minister of Transportation of the Republic of Indonesia Number KM 67 of 2023 concerning Tariffs for Transportation of People by Integrated Light Rail in the Jakarta, Bogor, Depok and Bekasi Regions to Carry out Public Service Obligations. Based on this regulation, it is stated that the LRT Jabodebek basic tariff for the first 1 Kilometer is IDR 5.000 and then IDR 700 for each subsequent kilometer.

2.4. Relationship between ATP and WTP according to (Tamin et al., 1999)

1. ATP is greater than WTP
   This condition shows that the ability to pay is greater than the desire to pay for the service. This happens when users have a relatively high income but the utility of the service is relatively low, users in this condition are called choiced

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riders.

2. ATP is smaller than WTP
   This condition is the opposite of the above condition, where the user's desire to pay for the service is greater than his ability to pay. This is possible for users who have relatively low income but the utility of these services is very high, so that the user's desire to pay for these services tends to be more influenced by utility, in this condition users are called captive riders.
3. ATP equals WTP
   This condition shows that the ability and desire to pay for the services consumed by the user are the same, in this condition there is a balance of user utility with the costs incurred to pay for these services.

3. Research method

3.1 *Sample and Population*

The population was taken from data from the DKI Jakarta Central Bureau of Statistics (BPS) which released the population of the Special Capital Region of Jakarta in 2022 as many as 10,679,951 residents. Then to find the number of samples, the researcher used the Slovin formula so that a sample of 100 people was obtained who were then willing to fill out this research questionnaire. Researchers use the Slovin formula because it can reach a large population with representative results. The following is a description of the distribution of the characteristics of this research sample

Table 1 Population (BPS Source)

Region	Total Population of DKI Jakarta		
	2020	2021	2022
Kep. Seribu	27.749	28.240	28.925
Jakarta Selatan	2.226.812	2.233.855	2.244.623
Jakarta Timur	3.037.139	3.056.300	3.083.883
Jakarta Pusat	1.056.896	1.066.460	1.079.995
Jakarta Barat	2.434.511	2.440.073	2.448.975
Jakarta Utara	1.778.981	1.784.753	1.793.550
Total	10.562.008	10.609.681	10.679.951

Table 2 Passengers Charateristic

Charateristic	Category	Frequency	Percentage
Gender	Male	67	67%
	Female	33	33%
	<20	5	5%
	20-30	64	64%

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Age	31-40	21	21%
	40-50	5	5%
	>50	5	5%
	High School	5	5%
Education	D3	22	22%
	S1	66	66%
	S2	7	7%
	Student	6	6%
	Employee	62	62%
	Civil Servant / Military/ Police	19	19%
Job	Housewife	2	2%
	Others	4	4%
	Enterpreneur	7	7%
Frequency using LRT Jabodebek (month)	1 – 10	29	29%
	11-20	53	53%
	21 - 30	15	15%
	>30	3	3%
Salary	0 – 4.900.000	13	13%
	4.900.001 – 8.000.000	42	42%
	8.000.001 – 12.000.000	32	32%
	12.000.001 – 16.000.000	9	9%
	>16.000.000	4	4%

3.2 Questionnaires

Questionnaires were conducted for this study in order to obtain primary data, namely Ability To Pay and Willingness To Pay. The questionnaire was distributed using open-ended questions and answers. This is done so that the answers from respondents are not limited to the answer options provided and reach deeper into respondents' preferences. Questionnaire based on previous references that was upgraded to find, among others, the amount of income, the frequency of riding transportation, the cost allocation for transportation, and the fare desired by passengers. Conducted using the e-survey method through the google form application to 100 respondents obtained from the slovin formula. The following ATP and WTP questions were asked:

Table 3 Questionnaire Items

Number	Questions
1	How much do you earn in a month?
2	How much will you spend specifically to use the LRT Jabodebek in a month?
3	How many times will you use LRT Jabodebek in one month?
4	With the LRT Jabodebek in commercial operation, what is the ideal and realistic tariffs for the longest route?

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4. Results and discussion

4.1. Ability to Pay

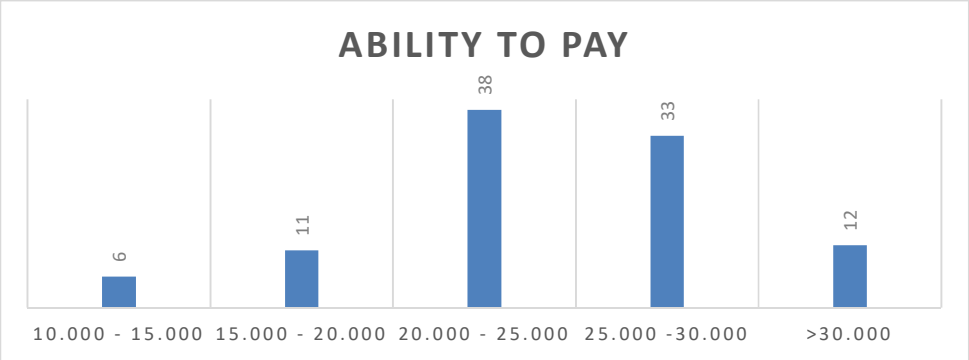

Figure 1 Ability To Pay

Respondents' ATP is obtained from the allocation of user fees divided by the frequency of riding the LRT Jabodebek in one month and in Figure 1 above it can be explained that respondents who have the ability to pay (10.000 – 15.000) are 6 people (6%), then for (15.000 – 20.000) as many as 11 people (11%), then the most are in the range (20.000 – 25.000) as many as 38 people (38%), then at the tariff (25.000 – 30.000) as many as 33 people (33%), and the last for the range> 30,000 there are 12 people (12%). With the midpoint ATP result of IDR 25.000, it is still below the existing tariff of IDR 27,400. The following ATP table is as below:

Table 4 ATP Value

No	Remark	Total
1	Maximum value	IDR 100.000
2	Minimum value	IDR 10.000
3	Midpoint	IDR 25.000

4.2.Willingness To Pay

Figure 2 Willingness To Pay

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WTP is obtained from direct and open and direct questions and from the research that has been conducted, the data obtained that the most respondents have the willingness to pay at the tariff of 20.000 – 25.000 as many as 40 people (40%), then at the tariff of 15.000 – 20.000 as many as 35 people (35%), then at the tariff of 10,000 - 15,000 there are 14 people (14%), at the tariff range of 25.000 – 30.000 there are 9 people (9%), and for tariffs > 30.000 there are 2 people (2%). With the midpoint WTP result of IDR 20.500, it is still below the existing tariff of IDR 27,400. The following WTP table is as below:

Table 5 WTP Value

No	Remark	Total
1	Maximum value	IDR 100.000
2	Minimum value	IDR 5.000
3	Midpoint	IDR 20.500

4.3. Passenger Character

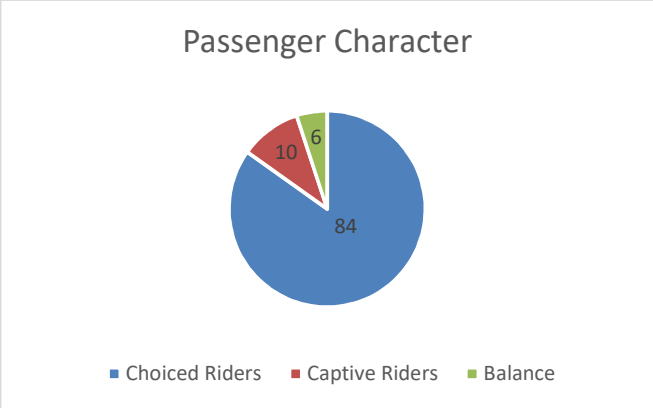

Figure 3 Passenger Character

After previously obtained respondent data regarding Ability To Pay and Willingness To Pay, then obtained the distribution of passenger characters according to Tamin (1999), namely that as many as 10 people (10%) are categorized as captive riders, which means that service users have a high income and the utility of using the LRT Jabodebek is smaller or in other words ATP is smaller than WTP, then as many as 84 people (84%) are categorized as choiced riders, which means that the ATP is bigger than WTP, this is also influenced by the respondent's income which is lower than the utility of using the LRT Jabodebek, then the last 6 people (6%) are categorized as a balance, which means that the ability and desire to pay are equal, this happens because the costs incurred are balanced with the utility or necessity of using the LRT Jabodebek.

4.4. Midpoint of ATP and WTP

After processing the Ability To Pay and Willingness To Pay data, a midpoint can be obtained that can be a reference for tariffs that can reach service users and increase occupancy for potential service users who still cannot reach the predetermined tariffs. The midpoint of this study is IDR 22.750.

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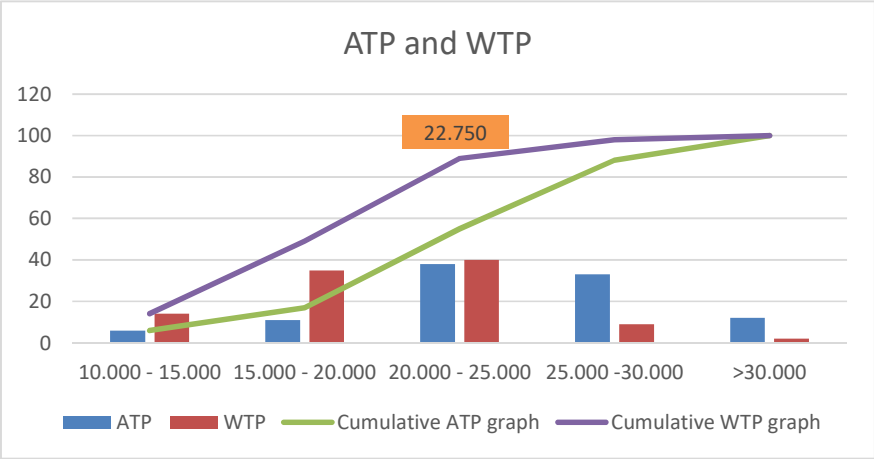

Figure 4 Midpoint of ATP & WTP

5. Conclusion

5.1. Based on the calculation results from the survey data, it is found that the midpoint value of Ability To Pay for service users is IDR 25.000 and the midpoint value of Willingness To Pay for service users is IDR 20.500, meaning that Ability To Pay is greater than Willingnes To Pay.

5.2. A total of 10 people (10%) are categorized as captive riders, 84 people (84%) are categorized as choiced riders, and 6 people (6%) are categorized as balanced.

5.3. From the research the results obtained the midpoint value of ATP and WTP is IDR 22.750. The results of the calculation can be used as consideration for future tariff adjustments that are lower than the existing tariff of IDR 27.400. With the results of the midpoint of ATP and WTP, it can be used as an evaluation data to reduce the existing tariff.

6. Implications

LRT Jabodebek has so far succeeded in attracting passengers to use its services, seen from the dense occupancy of trains, especially during working hours. However, when looking at this research, the results obtained by the midpoint value of ATP and WTP are IDR 22.750, which is still below the existing tariff of IDR 27.400. For solutions that can be used include, LRT Jabodebek can reduce the existing tariff and the second can make aspects such as the lack of disruption, punctuality, integration with other modes or other aspects improved so that service users do not object to the existing ticket price even though their willingness to pay or WTP is mostly still below the existing tariff. The company can also use a fluctuating fare method such as on weekends or when workers are off, the fare can be reduced or promoted to attract more passengers.

7. Research limitations

In research, of course, there are always problem limitations so that aspects outside the research interests do not interfere with the process and even the results of the research. In this study, the authors chose a problem limitation, namely that it was only carried out for LRT Jabodebek and only compared the ATP and WTP of the furthest route by finding the midpoint between the two. This research can be a reference for future research to find detailed fare data per station or kilometer or customer satisfaction research.

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