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# Analysis of willingness to pay for ‘Ketakasi’ ground coffee in Jember Regency

U H Chotima and J M M Aji\*

Agribusiness Department, Faculty of Agriculture, University of Jember, Indonesia  
Corresponding author: [joni.faperta@unej.ac.id](mailto:joni.faperta@unej.ac.id)

**Abstract.** Willingness to pay (WTP) has been widely used to measure the value of an item, both private and public goods, also shared resources. More recently, the WTP concept is also applied to marketing management for product development and pricing strategies. Ketakasi ground coffee is a premium Robusta coffee product of Jember Regency. The price of Ketakasi ground coffee per package with a net weight of 160 grams was sold at IDR 15,000, relatively more expensive compared to the price of branded ground coffee product which were sold at an average of IDR 12,000 per pack. Perception about the price of Ketakasi ground coffee which was considered expensive by consumers could make an obstacle for producers to achieve the expected target customers. This research aimed to determine the value of WTP of Ketakasi ground coffee; and factors influencing the WTP. A total of 60 respondents were interviewed in this research. Average value of consumers’ willingness to pay was analyzed by the descriptive statistics, while the factors influencing the willingness to pay consumers were analyzed by logistic regressions. Results showed that the value of consumers’ WTP reached IDR 16,000 per pack. This value was actually higher compared to the current market price, i.e., IDR 15,000, with consumer surplus of IDR 1,000. The taste of local coffee was identified as the main reason why consumers willing to pay higher than the current market price. Factors significantly influencing consumers’ WTP of Ketakasi ground coffee were consumer’s gender, types of jobs, and income.

## 1. Introduction

Coffee plays an important role in the Indonesian national economy, especially as a source of income and foreign exchange. The potential for the development of the Indonesian coffee commodity is quite large, as coffee is one of the most favorable drink for people around the world [1]–[3]. The amount of coffee consumption in Indonesia is increasing. Indonesia coffee consumption CAGR (Compound Annual Growth Rate) of 10,4%, as indicated in the forecast, is higher compared to US 1,4%, so it is necessary to develop coffee products. The development of coffee processing is expected to increase its role in supplying domestic market needs. To meet recent consumer demand where more consumers seek quality coffee, especially with the trend and the growing number of modern coffee cafés, coffee products must be delivered with good quality at competitive prices. In this situation, coffee processing should seek to meet this market demand so that it can increase sales with the aim of obtaining profits according to the capabilities and capacity of existing resources [4].

East Java is very rich in the potential for coffee cultivation as its geographical conditions are suitable for growing coffee. Data of coffee production East Java shows increasing trend, from 44,498 tons in 2006 to 65,414 tons [5].



Jember Regency is one of the coffee-producing centers in the East Java Region. Data on coffee production in East Java Province in 2013-2017 shows that Jember Regency is the highest coffee production in East Java. Coffee production in Jember Regency, respectively, is 3,105 tons, 2,893 tons, 3,149 tons, 10,863 tons, and 11,863 tons [6]. There are several coffee-producing areas in Jember Regency, one of which is Silo District. Sidomulyo Village is one of the villages in Silo District that produces coffee. The coffee in Sidomulyo Village is mostly Robusta coffee, only few farmers cultivate Arabica coffee more recently. The Robusta coffee production in the Village is carried out by smallholder farmers' group, while the coffee processing is managed by the Multipurpose Business Cooperative (KSU) 'Buah Ketakasi'. This farmers' cooperative produces several products including green bean, roasted, and ground coffee.

'Ketakasi' ground coffee is widely known as a quality or premium product of Jember Regency. This study seeks to identify what price is suitable for the ground coffee. To determine what the right price for the 'Ketakasi' ground coffee as a special coffee product, this study employs the concept of consumers' willingness to pay. Willingness to pay (WTP) shows the maximum price of a product at or under which a consumer will certainly buy a unit. A person's highest willingness to pay for something is also the person's reservation price. It is the maximum price that a particular person shall accept and purchase the good or the service [7], [8]. The concept of WTP has been widely used to measure the value of an item, both private and public goods, also shared resources [9]. More recently, the WTP concept is also applied to marketing management for product development and pricing strategies [10], [11]

The objectives of this study were (1) to determine the value of the WTP of the 'Ketakasi' ground coffee consumers and (2) to analyze the factors affecting the WTP of the 'Ketakasi' ground coffee consumers in Jember Regency. The product the researchers studied focused on the ground coffee sachet with a net of 160 grams which was sold at IDR 15,000.

## 2. Research Methods

This research area was carried out in Jember Regency with the consideration that it is one of the coffee-producing centers within which one of its famous coffee product namely 'Ketakasi' ground coffee is produced by a smallholders' cooperative known as Multipurpose Business Cooperative (KSU) 'Buah Ketakasi'. The method used in this research is descriptive and analytic methods. The sampling method in this study used the incidental sampling technique with a total of 60 respondents. The data used in this study are primary data from interviews and secondary data obtained by related agencies and literature studies.

The CVM approach was utilized to analyze the first problem regarding the value of consumers' WTP of 'Ketakasi' ground coffee in Jember Regency. This approach uses a direct survey, which is to ask the respondent directly about how much they are willing to pay for a package of ground coffee with a net of 160 grams. The procedures in the operational stage applied in the CVM approach include [12]:

1. Create a market hypothesis
2. Get auction value
3. Calculating the average WTP.
4. Estimating the auction curve
5. Aggregate data

Furthermore, factors influencing the consumers' willingness to pay of 'Ketakasi' ground coffee was analyzed using logistic regression. The independent variables used in the model include age, gender, occupation, and income. The logistic regression model [13] can be described as follows:

$$\text{Log}(p / 1-p) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + e_i A$$

Note:

- Log (p/1-p) : WTP of ‘Ketakasi’ ground coffee (0 = if the consumer is willing to pay more dan  
1 = if the consumer is not willing to pay)
- $\beta_0$  : constant
- $\beta_1$ – $\beta_4$  : independent variable regression coefficients
- $X_1$  : age (year)
- $X_2$  : gender (1 = male; 2 = female);
- $X_3$  : occupation (1 = employee; 2 = non-employee);
- $X_4$  : income (1= < IDR 1.5 million, 2= IDR 1.5 million - IDR 3 million, dan 3= > IDR 3 million);
- $e_i$  : random variable error;

The steps carried out by logistic regression analysis can be described as follows [14]:

1. Goodness of fit test using Pearson, Deviance, and Hosmer-Lemeshow Methods.
2. Significance test: Significance of using statistical test G and Wald test to test the overall model and partial test (individual), respectively.
3. Test the whole model simultaneously with the G test: Using the likelihood ratio test at the 95% confidence level.
4. Partial parameter testing uses the Wald (W) test.
5. Interpreting the value of the tendency ratio formed: If the coefficient value has a positive sign, then the odds ratio value will be greater than one, conversely if the coefficient sign is negative then the odds ratio value will be less than one.

### 3. Results and Discussion

#### Value of Willingness to Pay of ‘Ketakasi’ Coffee Consumers in Jember Regency

To find out the value of WTP for the ‘Ketakasi’ ground coffee, a series of interviews or surveys were carried out directly to consumers with five stages in applying the Contingent Valuation Method (CVM) analysis as follows:

##### 1. Making a Market Hypothesis

Information about the ‘Ketakasi’ ground coffee product and price were asked and explained to the respondents. Information about the price of Robusta ground coffee competitors in Jember Regency was also given as a comparison. The objective of a hypothetical market is basically to ask the respondent what the maximum price they are willing to pay for the product being researched.

##### 2. Get Auction Value

The method used to determine the maximum value of consumers’ WTP for ‘Ketakasi’ ground coffee. This study used an open question technique. Through this technique, respondents are given the freedom to choose the value they want to pay for the ground coffee. The initial value used is IDR 15,000 for a package of 160 gram, the price set by the producer. The results showed that of the 60 respondents, 50 respondents were willing to pay more than IDR 15,000/160 grams. The reason the respondents are willing to pay more is because from the processing to packaging aspects, the taste and quality are very well maintained. Nonetheless, there were 10 respondents who refused to pay more than IDR 15,000. The reason respondents are not willing to pay more is because the ground coffee is too expensive compared to its competitors. Other respondents stated that they had limited income, so they just wanted to purchase coffee at lower prices than those set by the producers.

##### 3. Calculating the Average WTP

The average value of WTP is obtained based on the distribution of WTP by using the multiplication between the WTP value of the respondent and the relative frequency of the ground coffee respondents. At this stage, the estimated average WTP value of the respondents to the maximum price of the ground coffee product is obtained based on the WTP value given by the number of respondents willing to pay

that price. The following table explains the results of the calculation of the average WTP value for the 'Ketakasi' ground coffee.

Table 1. Consumers' Average WTP for 'Ketakasi' Ground Coffee.

No.	WTP Value (IDR)	Number of Respondents	Relative Frequency	Total PAP (IDR)	Mean WTP (IDR/person)
1.	14,000	10	0.17	140,000	2333.33
2.	16,000	32	0.53	512,000	8533.33
3.	17,000	10	0.17	170,000	2833.33
4.	18,000	8	0.13	144,000	2400.00
<b>Total</b>		<b>60</b>	<b>1</b>	<b>966,000</b>	<b>16,099.99</b>

Table 1 shows that the maximum average price the consumer WTP for 'Ketakasi' ground coffee is IDR 16,000. This value is higher than the price set by the producer which is IDR 15,000. This average value indicates that there is a consumer surplus because the average WTP value is IDR 1,000 higher than the current price. The existence of an excess price of IDR. 1,000 in economic terms is identified as a consumer surplus. While some 10 respondents said the price was too expensive, a total of 50 respondents were willing to pay for the ground coffee at a price higher than the price set by the producer.

#### 4. Estimating the Auction Curve

WTP curve describes the addition of WTP prices to the number of respondents who are willing to pay for a package or a unit of 160 gram of 'Ketakasi' ground coffee. WTP curve of the respondents of 'Ketakasi' ground coffee drawn based upon the cumulative sum of the number of respondents who chose a particular WTP value. The WTP curve has a negative slope if the higher the WTP value, the less people are willing to pay more and vice versa.

#### 5. Aggregating Data

WTP data aggregation is a process in which the sample mean is converted to the total population mean value as a whole. The method used is multiplying the average value of WTP of 'Ketakasi' ground coffee and the total of research sample. The total WTP in this case can be used as information regarding the financial potential that can occur in an area from an increase value in the quality of ground coffee. The calculation results show that the total WTP is IDR 966,000. Figure 1. shows the consumer surplus of 'Ketakasi' ground coffee in Jember Regency.

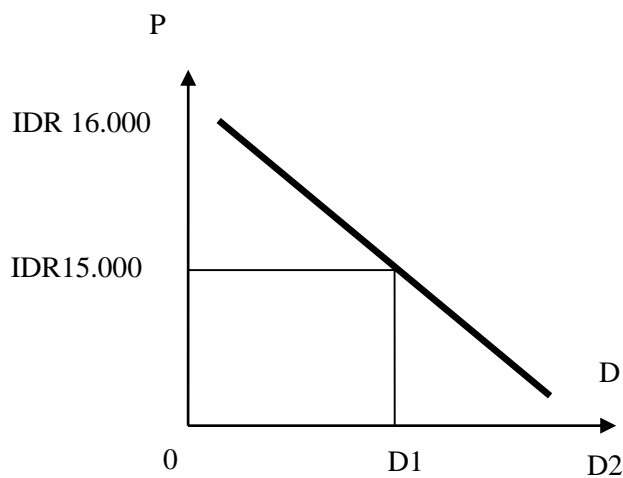


Figure 1. Consumer Surplus of 'Ketakasi' Ground Coffee

Figure 1. shows the consumer demand curve for 'Ketakasi' ground coffee with demand by  $D_1$  and the prevailing market price of IDR 15,000. Consumers are willing to pay a unit of 'Ketakasi' ground coffee at IDR 16,000, so that the difference between the value of which amounted to IDR 1,000 so-called as consumer surplus. The area above the straight line of producer prices and below the consumer demand curve is the area of consumer surplus within the market. From this figure it can be concluded that the consumer surplus is the area under the demand curve which is larger than the prevailing market price [15]. The value of consumer surplus of 'Ketakasi' ground coffee was IDR 1,000 and the aggregate value of WTP 'Ketakasi' ground coffee obtained was IDR 966,000. This condition can be used as a consideration by the producer to get maximum profit by increasing the quality of production raw materials and increase the current price if necessary as it is possible to do so.

#### Factors Affecting Willingness to Pay of 'Ketakasi' Coffee Consumers in Jember Regency

Factors affecting consumer's WTP of 'Ketakasi' ground coffee was analyzed using logistic regression. In this regard, the logistic regression model must comply with some criteria so that the model used is considerably feasible. Based on the analysis, the proposed model is feasible to be used, since it meets the Goodness of Fit Test using Omnibus Tests of Model coefficients, Pearson, Deviance, and Hosmer-Lemeshow Methods as well as test the whole model simultaneously using the likelihood ratio at the 95% confidence level. The Chi square value of the Goodness of Fit test is 3,547. The significance value of 0.895 or greater than the 95% confidence level, the logistic regression model used is able to explain that the logistic regression model fits the data and is suitable for use in further analysis. The value Nagelkerke R Square of 0.612 means that the ability of independent variables in explaining the dependent variable is equal to 0.612 or 61.2%, while the other 38.8% are explained other factors which is not included in the model or beyond the model. The results of logistic regression analysis for each independent variable can be seen in Table 2.

Table 2. Binary Logistic Regression (BLR) Results

	B	SE	Wald	Df	Sig.	Exp (B)	95% CI for	EXP (B)
							Lower	Upper
Age	.064	.063	1.028	1	.311	1.066	.942	1.207
Gender	2.617	1.310	3.991	1	.046*	13.701	1.051	178.650
Step 1 Occupation	2.532	1.259	4.047	1	.044*	12.583	1.067	148.370
Income	-2.526	1.263	4.000	1	.046*	.080	.007	.951
Constant	-6.731	4.429	2.310	1	.129	.001		

Source: Primary data processed in 2019

Note: \*): Significant at the 95% confidence level

The logistic regression equation model obtained from the results of the analysis in Table 2 can be depicted as follows:

$$\text{Log (p/ 1-p)} = -6,731 + 0.064 \text{ Age} + \mathbf{2,617 \text{ Gender}^*} + \mathbf{2,532 \text{ Occupation}^*} - \mathbf{2,526 \text{ Income}^*} + e,$$

Table 2 shows that there are several independent variables, namely gender (X2), occupation (X3), and income (X4) that significantly influence the consumers' WTP for 'Ketakasi' ground coffee in Jember Regency. Meanwhile, age (X1) does not significantly influence the consumers' WTP as its significance value is greater than 0.05. Further discussion of each independent variable influence to consumers' WTP is described as follows.

a. Age (X1)

Age (X1) has no significant influence on WTP of the ground coffee product where its significance of  $0.311 > 0.05$ . This is because the WTP of people at the similar ages tends to vary due to other factors, especially income and gender.

b. Gender (X2)

Gender (X2) shows a significant influence on consumers' WTP of the ground coffee product, where its significance of  $0.046 < 0.05$ . This means that gender significantly affects the consumers WTP at 95% confidence level. This is because male consumers are willing to pay more than the female consumers. The regression coefficient for the gender variable is 2.617, so it can be interpreted that if the number of consumers increases by one person, it will increase the chances of consumers willingness to pay more for the ground coffee product of 2.617. The exp value (B) for the variable gender of consumers is 13.701 indicates that the male consumers tend to be willing to pay more for the ground coffee product 13.7 times greater than that of the female consumers. This finding is in line with Eka et al. [16] where in their research entitled "Willingness To Pay Analysis of 'Srikandi' Organic Egg Products in Jember Regency" found that gender is a variable that influences the WTP.

c. Occupation (X3)

Occupation (X 3) shows a significant influence on consumers' WTP of the ground coffee product, where its significance of  $0.044 < 0.05$ . This means that type of occupation significantly affects the consumers WTP at 95% confidence level. The occupation variable in this study is categorized into two types, namely: (1) Employees and (2) Non-Employees. The regression coefficient for the occupational variable is 2.532, it means that if the number of employee consumers increases by one person, it will increase the chances of consumers willing to pay more for the ground coffee products by 2.532 . The exp value (B) for the consumer occupation variable is 12.583 which indicates that the employee consumers tend to be willing to pay more for the ground coffee product by 12.583 times greater than that of the non-employee consumers. This finding is in accordance with Rahayu et al. [17] in their research entitled "Analysis of Willingness To Pay for Beras Cerdas (Smart Rice) CV An-Nahlah in Jember Regency" which found that occupation is a variable that influences the WTP.

d. Income (X 4)

Income (X4) shows a significant effect on consumers' WTP of the ground coffee product, where its significance of  $0.046 < 0.05$ . This means that income affects the WTP at the 95% confidence level. Income variable in this study is categorized into three levels, namely: (1) <IDR 1,500,000, (2) IDR 1,500,000-IDR 3,000,000, and (3) > IDR 3,000,000. The regression coefficient is -2.526, it means that if the consumer's income is 1 level higher (the coefficient of the income variable is getting smaller), then the opportunity for consumers to be willing to pay is higher by 2.526. Value exp (B) for variable consumer's income is equal to 0.080 which shows that consumers 'Ketakasi' ground coffee with middle income and above tend to be willing to pay more for the ground coffee product by 0.080 times greater than the consumers who have a lower income. This finding is in accordance with Eka et al. [16] where in their research entitled "Willingness to Pay Analysis of 'Srikandi' Organic Egg Products in Jember Regency" found that income is a variable that influences the WTP.

#### 4. Conclusion

Based on the results of research and discussion, the conclusions obtained are as follows:

1. The value of consumer willingness to pay (WTP) of 'Ketakasi' ground coffee for a package of 160 gram is IDR 16,000. This value is greater than the price set by its producer, i.e., Multipurpose Business Cooperative (KSU) Buah Ketakasi, which is IDR 15,000, so that a consumer surplus of IDR 1,000 is obtained.
2. The WTP of 'Ketakasi' ground coffee in Jember Regency is significantly influenced by gender, occupation, and income. Male consumers tend to be willing to pay more than the female consumers, while the employees are willing to pay more than non-employees and the higher income consumers are willing to pay more than the lower one.

These findings are expected to help Multipurpose Business Cooperative (KSU) 'Buah Ketakasi', the ground coffee producer as a reference in the 'Ketakasi' ground coffee pricing strategy. This smallholder-farmers' cooperative is suggested to develop a marketing strategy in an effort to increase the purchase of ground coffee by expanding the marketing network at outlets that are closer to consumers, for example through many typical Jember gift shops across the town or online market places so that it makes it easier for consumers to get the product. With IDR 1,000 consumer surplus, the producer still has a chance to slightly increase the price of its product or provide a margin for its partner or reseller to sell the product at a slightly higher price.

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