

Demand Analysis of Noodle as Staple Food in Surabaya

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Abstract: Noodles as staple food is processed in various menu. There was no prior studies in noodle demand analysis in Surabaya, Indonesia. This study aims to examine the influence of price and buyers' income on the noodle sales in a noodle restaurant. Using 30 respondents by convenience sampling method, the nominal data were collected in March 2020. The methodology used is quantitative approach with multiple linear analysis, F Test, and T Test. Using Primary data and the results of a questionnaire conducted with a population of 30 men and women aged 19-40 years. The results of this study indicate no significant effect between the price of noodles and the average income to the sales of noodle simultaneously. Whereas, partially, there is significant effect of the price of noodles although there's no effect of average income on the sale of noodle at the noodle restaurant. The contribution of those independent variables (noodle prices and average income) to the dependent variable (noodle sales) is very low, which shows only 5.30% means that the other variables may influence the noodles sales at the restaurant.

Keywords : Demand, Demand analysis, Food, Noodles, Staple food

I. INTRODUCTION

Food is a basic human need besides shelter and clothing. Primary needs are minimal physical needs of humans, which are related to the adequacy of basic needs for both the poor and rich. In other words, primary needs are the main needs that must be fulfilled by a person to be said to live properly as a human being, as well as to ensure their survival. A long thin piece of dough made from a combination of eggs, flour and water that is usually cooked in soup or boiling water, is called a noodle. This food is made from a leafless dough made from various types of components (Sikander et al.2017). Noodle is a very popular food product and is widely consumed by the people of Indonesia. Given with a variety of processed noodles provided, the research object becomes a popular place to eat noodles among the young people in Surabaya, and this study is to examine whether the price and income will be factors that influence the noodle demand in the restaurant or not.

II. LITERATURE REVIEW

2.1 Definition of Demand

According to Braekkan (2015), theoretically, demand is assumed as the choice of a consumer whom given a limited budget. This choice is based on the action to maximizing the utility of a bundle of goods. This maximization is unique because of the different utility at every price and budgetary level among consumers. As well Demand is an economic principle that describe a consumer's desire and williness to pay a price for a specific good or service. In short demand refers to how much (quantity) of a product or service is desire by buyers. The quantity demanded is the amount of a product people are willing to buy at a certain price; the relationship between price and quantity demanded is known as the demand relationship (Dametew,2017).

2.2 Demand Function

The law of demand says that an increase in price will reduce the quantity that people want to buy and a decrease in price will raise the quantity people want to buy (Buechner, 2018). According to Murjani (2017) the demand function describes the relationship between the quantities of goods and services, prices, and income. The quantity demanded will be determined by the prices and the households' income. the determinants of demand are the major factors determining demand size (Safiullin, et al.2015). They are subdivided into two big groups, price and non-price. The following price factors belong to the first group of determinants of demand:

1. Price of these goods.

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2. The prices of the goods replacing this good in consumption or goods substitutes (interchangeable goods).
3. The prices of the goods supplementing this good in consumption or the complementary goods (complementary goods).

Demand volume significantly depends on quality of these goods, quality of goods substitutes, on quality of the complementary goods. Therefore in addition we suggest to enter into the second group of determinants:

1. Quality of these goods, quality of interchangeable and quality of complementary goods; also we will allocate the known factors of demand influencing a choice of the buyer.
2. Income of consumers, consumer requirements for quality, tastes and preferences of consumers.

2.3 Demand Curve

The demand curve is a graphical representation of the relationship between the price of a good service and the quantity demanded for a given period of time. Typically, the price will be on the left vertical axis, the quantity demanded on the horizontal one (Kenton, 2019)

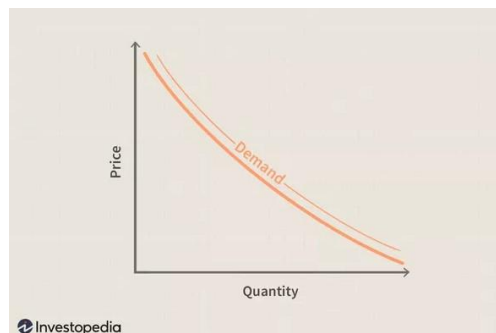


Figure 1, Demand Curve Illustration

Source : (Kenton, 2019)

The demand curve will move downward from the left to the right, to express the law of demand, all else being equal.

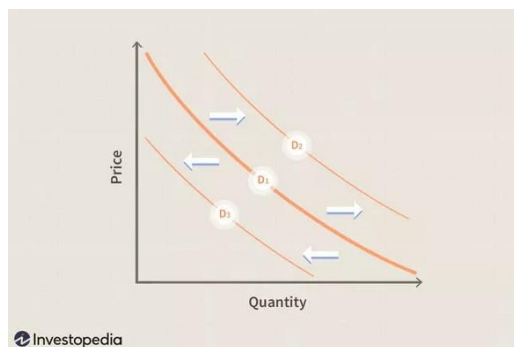


Figure 2, Shift in the Demand Curve

Source :(Kenton, 2019)

Other factors can shift the demand curve as well, such as a change in consumers' preferences. In Fig 2, if the price of a substitute, based on the consumer's perspective, increases, consumers will buy the product instead, so the demand will shift right (D2). If the price of a complement, such as product to product, increases, demand will shift left (D3). If the future price of product is higher than the current price, the demand will temporarily shift to the right (D2), since consumers have an incentive to buy now before the price rises. The terminology, in daily usage, might be called the "demand," but in economic theory, it refers to the curve shown above, as the relationship between quantity demanded and price per unit (Kenton, 2019).

2.4 Demand Factors

The factors that influence demand come from the demand function, namely the price of the item itself, the price of other goods, the number of residents' tastes or habits, future price expectations, and also the income of the community. The factor is the price of goods demanded. The indicators that characterize prices are: affordability as the actual price of the product written on a product to be paid by the customer, the suitability of the price with the quality of the product, the competitiveness of prices as the ability to compete between products, the suitability of the price with the benefits and

the price is in accordance with what the customer wants (Situmorang, 2018). Prices of related goods whose changes of related goods generally shift the demand curve for goods is another factor of demand. Substitution goods is an increase or decrease in the price of one item which can cause an increase or decrease in the demand for other goods and complementary goods shows an increase or decrease in the price of one item that causes a decrease or increase in demand for other goods (Baye, 2016).

Household income and average income of the community is the main factor which shows the consumers' ability to pay (Situmorang, 2018). For some goods, when income increase, the demand for goods will also increase. Income is also defined as the number of receipts that are valued in units of money within a certain period (Taufiq, et al., 2018). An item whose demand increases (on the demand curve shifts to the right) when consumer income rises is called normal goods and when consumers suffer a decrease in income, demand for normal goods decreases. In some cases, an increase in income reduces the demand for an item. These are called as inferior goods because when the income rises, consumers generally consume less at each given price. The demand for a product is also affected by changes in population size and composition. In general, as the population increases, more individuals will buy certain products, and this has the effect of shifting the demand curve to the right. Consumer taste and expectation are also the factors of demand. Baye (2016) indicates the advertising level is another variable that is considered constant when describing a demand curve while the consumer expectation can change the demand curve if consumer changes current purchases for future purchases because they think the future prices will be higher which results in a behavior type as stockpiling and generally occurs in durable products (Baye, 2016).

2.5 Staple Food

During the 20th century, food products shifted to the right quite significantly with increasing population. A staple food is a food that makes up dominant part of a population's diet (Henuk, 2018). Out of a potential 50,000 edible plants, just three of them provide most of the world's food energy, maize, rice and wheat. Noodles are essential foods made from extruded wheat flour dough (Adejunwon et. al, 2019). Noodle is the most popular type of food in Asia, especially East Asia and Southeast Asia can be made from various kinds of flour namely wheat flour, rice flour, rice flour, starch flour, and mung bean flour."

III. METHODOLOGY

3.1 Data Collection

The data used are primary in the form of monthly time series data for 1 month, namely the February to March 2020 period. Primary data obtained from the noodle restaurant is directly related to the selling price of noodle at the restaurant and questionnaire data that is spread among consumers ages 19-40 years old (Shown in Table 1 and 2).

Table 1. Price List of Noodles and Sales Data

Respondent No.	Price List of Noodles (IDR)	Sales List (Unit)	Respondent No.	Price List of Noodles (IDR)	Sales List (Unit)
1	8,500	50	16	8,500	51
2	8,500	51	17	8,500	55
3	8,500	45	18	8,500	47
4	8,500	30	19	8,500	52
5	8,500	55	20	8,500	51
6	8,500	54	21	8,500	50
7	8,500	52	22	8,500	50
8	8,500	49	23	8,500	49
9	8,500	51	24	8,500	54
10	8,500	52	25	8,500	55
11	8,500	53	26	8,500	49
12	8,500	59	27	8,500	47
13	8,500	57	28	8,500	42
14	8,500	45	29	8,500	59
15	8,500	50	30	8,500	50

Source : Primarily Data (Author, February 2020)

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The price list of the noodle sold in the restaurant is flat at IDR 8,500 per portion (unit). This restaurant will add the price if the consumers' ask for additional topping on the served noodle. However, the respondents taken were not consume the additional food topping so the price are the same for all respondents.

Table 2. The Average Income of Consumers

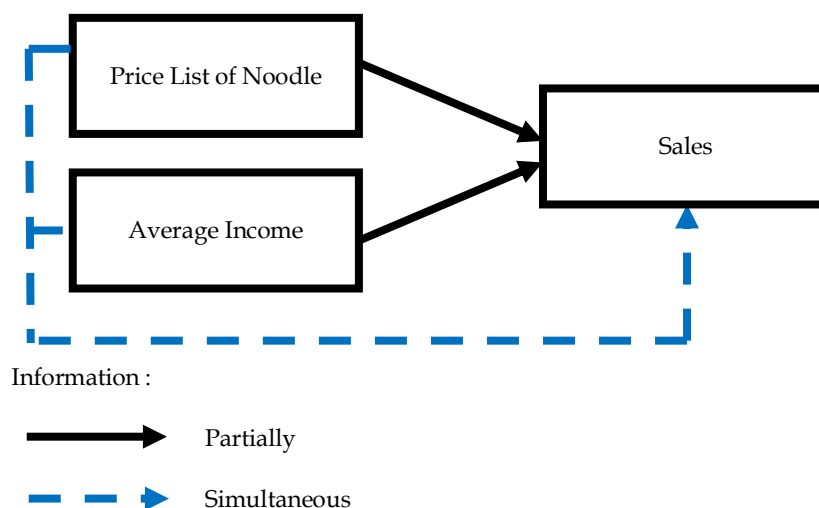
Respondent No.	Income (IDR)	Respondent No.	Income (IDR)
1	500,000	16	1,000,000
2	2,500,000	17	1,000,000
3	2,500,000	18	500,000
4	1,000,000	19	1,000,000
5	600,000	20	2,000,000
6	1,000,000	21	1,000,000
7	1,000,000	22	500,000
8	2,500,000	23	2,500,000
9	1,000,000	24	2,500,000
10	2,500,000	25	500,000
11	2,000,000	26	1,000,000
12	1,000,000	27	2,500,000
13	900,000	28	2,500,000
14	900,000	29	500,000
15	2,500,000	30	5,000,000

Source : Primary Data (Author, February 2020)

The research area was determined purposively in a staple Food restaurant that is frequently visited by the surrounding community.

3.2 Measurement Technique

This study uses quantitative approach data and data from this study are collected and then processed and analyzed. To calculate how significant the data is, the writer uses multiple linear regression analysis, F test, and T test. The research framework of the research is:



Based on the conceptual framework above, it can be explained that this study has two independent variables (noodle prices and average income) and one dependent variable (sales). This conceptual framework is used to guide researchers in conducting research. The study was conducted to direct researchers to conduct research. The study was conducted to determine the effect of the three independent variables on the dependent variable, both partially and simultaneously. it can be defined that the influence partially, namely:

H₀: The price of noodles and average income partially influence the sales of noodles.

Ha: The price of noodles and average income simultaneously influence the sales of noodles.

IV. RESULTS AND DISCUSSIONS

This section will discuss the analysis of the factors that influence the demand for noodles at the Surabaya Staple Food restaurant which will be analyzed using multiple linear regression analysis models. Table 3 shows the correlation analysis between the variables.

Table 3. Mean and Standard Deviation

Variable	Mean	Standard Deviation	N
Noodles price	8,500	0	30
Sales	50,466	0	30
Income	1,533,333.333	3,181,980.515	30

Source : Ms. Excel Counting

Based on the above table, researchers can explain that the average community income (Y) is IDR 1,533,333.333 with a standard deviation of 3,181,980.515. While the average price of noodles at the Restaurant X in Surabaya (X₁) Restaurant is IDR 8,500 with a standard deviation of 0. Variable sales of noodles (X₂) of 50,466 with a standard deviation of 0.

The Multiple Linear Regression Test is used to determine the relationship between two or more independent variables (X₁, X₂,X_n) to the dependent variable (Y) simultaneously. This coefficient shows how big the relationship between the independent variables (X₁, X₂,X_n) simultaneously against the variable (Y). R value ranges from 0 to 1, the value is getting closer to 1 means that the relationship is getting stronger, on the contrary the value is getting closer to 0, the relationship is getting weaker. The guidelines to provide the interpretation of the correlation coefficient as follows:

- 0.00 - 0.199 = very low
- 0.20 - 0.399 = low
- 0.40 - 0.599 = is on
- 0.60 - 0.799 = strong
- 0.80 - 1.000 = very strong

Table 4. Regression Statistic Table

Multiple R	0.232037303
R Square	0.05384131
Adjusted R Square	-0.01624451
Standard Error	9
Observations	30

Source : Ms. Excel Counting

Based on the table above obtained R (multiple R) of 0.232 or 23.2%, this shows that there is a weak relationship between the price of noodles and the average rate of sales of noodles. Based on the above table, the R² (R Square) figure is 0.053 or 5.30%.this shows that the percentage contribution of the influence of the independent variable (noodle prices and average income) to the dependent variable (noodle sales) is 5.30%. or the variation of the independent variables used in the model (noodle prices and average income) is able to explain 5.30% of the variation of the dependent variable (sales). While the remaining 0.947 or 94.7% are influenced or explained by other variables not included in this research model. Adjusted R Square is an adjusted R Square value, this value is always smaller than R Square and this number can have a negative price. The Standard Error of the Estimate is a measure of the number of errors of the regression model in predicting the value of Y. From the regression results, a value of 5.526 can be obtained. as a guideline if the Standard Error of The Estimate is less than the standard deviation of Y, then the regression model is better at predicting the value of Y.

The F Test is used to find out the significant effect between the independent variables (X₁, X₂,X_n) and the dependent variable (Y) together. Or to find out whether the regression model can be used to predict the dependent

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variable or not. Significant means the relationship that occurs can apply to the population (can be generalized), for example from the case above the population is adolescent and adult samples taken 30, so whether the influence that occurs or the conclusions obtained are valid for all adolescent and adult populations.

Table 5. Test F Table (Anova)

	df	SS	MS	F	Significance F
Regression	2	46.92090684	23.4604534	0.76821963	
			2	5	0.473711322
			30.5387318		
Residual	27	824.5457598	5		
Total	29	871.4666667			

Source : Ms. Excel Counting

Based on the F Test table the following results are obtained:

- Hypothesis
 - H_0 : There is no significant influence between the price of noodles and the average income together - the demand for noodles.
 - H_a : There is a significant influence between the price of noodles and the average income together - the demand for noodles.
- Significant level of 5% = 0.05
- F count based on the table above is 0.768
 - F table with 95% confidence $\alpha = 5\%$
 - df 1 = 2
 - df 2 = 30-2-1 (n-k-i) = 27
 - Result = (in excel formula)
 - = finv (0.05; 2; 27 = 3.354
- Testing criteria
 - H_0 : accepted if F count < F table = 0.768 < 3.354
 - H_a : rejected if F count > F table
- Comparison of F arithmetic and F tables
 - The calculated F value < F table (0.768 < 3.354), then H_a is rejected.

As the F arithmetic < from F table (0.768 < 3.354), then H_a is rejected, meaning that there is no significant effect between the price of noodles and the average income of request noodles together. Partial Regression Coefficient Test (T Test) then is used to determine (Table 6) whether the regression model of independent variables (X_1, X_2, \dots, X_n) partially has a significant effect on the dependent variable (Y).

Table 6. t-Test Table

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
				1,52107E-				
Intercept	5,186924813	1,842941404	2,814481678	21	48,08784472	5	48,08784472	55,65065155
X Variable 1	0	0	65535	#NUM!	0	0	0	0
			-					
X Variable 2	-9,06841E-07	9,97132E-07	0,909449889	#NUM!	-2,95279E-06	1,1391E-06	-2,95279E-06	1,1391E-06

Source : Ms. Excel Counting

The result of t-test the variable regression coefficient of price list noodle (X_1)

- Determine the hypothesis
 - H_0 : Partially there is no significant effect between the price of noodles and the sale of noodles
 - H_a : Partially there is a significant influence between the price of noodles and the sale of noodles
- Determine a significant level

- Significant level use = 5%
3. Determine t count
Based on the table obtained by t count of 6.5535
 4. Determine t table
The distribution table t is searched for $\text{sig.} = 5\% : 2 = 2.5\%$ (2 sided test) with degrees of freedom (df) $n-k-1$ or $30-2-1 = 27$ (n is the number of cases and k is the number of independent variables). With 2 sided testing (Sig.= 0.025) results are obtained for t tables of 2.05183.
 5. Testing Criteria
 H_0 accepted if t count < t table
 H_a is accepted if t count > t table = 6.5535 > 2.05183
 6. Compare t count with t table
Score t count > t table (6.5535 > 2.05183) then H_0 is rejected.

Therefore score t count > t table (6.5535 > 2.05183) then H_0 is rejected and H_a is accepted, means that partially there is a significant influence of the price of noodles to the sale of noodle. So from this case it can be concluded that partially the price of noodles will influence the sale of noodle at the restaurant. As staple food in most Asian countries, the increasing price of noodles will not reduce the sales significantly. The consumers still consume noodles for their daily needs, but apart from that reason, the restaurant's price for its noodle menu is not expensive enough for consumers, so the consumers get the benefit from the products in accordance with the price they have to pay. There is the suitability of the price with the benefits and the price is in accordance with what the customer wants. However, when the other products of staple foods decrease or considered more affordable, then consumers will change to other products (Situmorang, 2018).

Towards the variable X2 the results of the t-test is following the steps below:

1. Determine Hypothesis
 H_0 : Partially, there is no significant effect between average income and the sale of noodle
 H_a : Partially there is a significant influence between average income and the sale of noodle
2. Determine a significant level
Significant level use = 5%.
3. Determine t count
Based on the table obtained by t count of 0.909449889
4. Determine t table
The distribution table t is searched for = 5% : 2 = 2,5% (2 sided test) with degrees of freedom (df) $n-k-1$ or $30-2-1 = 27$ (n is the number of cases and k is the number of independent variables). With 2 sided testing (significantly = 0.025) h results are obtained for t tables of 2.05185.
5. Testing criteria
 H_0 accepted if t count < t table = 0.909449889 < 2.05183
 H_a accepted if t count > t table
6. Comparing t count with t table
Score t count < t table (0.909449889 < 2.05183) then H_0 is accepted and H_a is rejected.

Therefore score t count < t table (0.909449889 < 2,05183) and H_0 is accepted. It means partially there is no significant effect of average income to the sales of noodles. So from this case it can be concluded that partially the average income did not significantly influence the sale of noodles as the staple foods. Demand of the noodles may also depend on quality of these goods, substitute and complementary goods and in the other issues, it will depend on tastes and preferences of consumers (Safiullin, et al.2015) so this study doesn't find the connection of consumers' income to the sales of noodles at the restaurants.

V. CONCLUSIONS

In business competition, retaining customers is difficult, because the market for business people is customers where customers have the right to win and get what they want. But before that wish is fulfilled, the first thing that must be fulfilled is the need. As in the background that food is a major need besides shelter and clothing, meaning that the need for food cannot be replaced or eliminated by other needs. In Indonesia people replace rice with other foods such as noodles. This study aims to determine the factors that influence the sales of noodles on staple food in Surabaya with demand analysis. As in the results of the multiple linear regression test showed the effect of noodles' price to the sale of noodles at the studied restaurant but there's no effect of consumers' income to the sale of noodles. The contributions of the studied independent variables to the dependent variables are too low, indicated that there are more than 90% of noodles sales at the restaurant will be caused by other variables excluded in this study.

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Some suggestions are raised from this research for the staple food restaurant that it is expected that sales that occur every day continue to increase with stable noodle prices and many interested people as the most visited restaurant is retained and more customers interest and become loyal customers. The next research similar to this topic should add more data and use different variables that may influence the demand of the staple food, especially noodles.

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