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STRATEGIC FOOD PRICE ELASTICITY IN EAST JAVA INDONESIA

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ABSTRACT

Threats to food security have resulted in Indonesia frequently importing food products to meet domestic needs. Therefore elasticity of strategic food is important to study. The study results can be used as a reference for policy making in an effort to improve food security. The Study used a quantitative descriptive analysis method on Cross Section data from Susenas in March 2016. Analysis to identify household consumption preferences for food commodities (rice, corn, beef, shallots, chilies, and sugar) was performed using Microsoft Excel calculations. The analysis used to estimate the LA/AIDS model demand system is SUR. The results of the study show that the share of strategic food expenditure in East Java is strongly influenced by the price of the commodity itself, the price of other commodities and the amount of income in real terms, rice is the most preferred commodity compared to other commodities. Beef is still a luxury item that is relatively unaffordable by households in East Java. Rice is an elastic product according to Marshallian elasticity, but inelastic according to Hicksian elasticity. The Marshallian and Hicksian elasticity values are both negative, meaning that rice is a normal good. Rice price stability needs to be maintained so that household consumption is fulfilled. Given the negative elasticity of rice, which means when there is an increase in the price of rice, the demand for rice will decrease.

Keywords*: income elasticity, price elasticity, strategic food*

BACKGROUND

Food is the most important basic human need, therefore its fulfillment is part of the human rights of every individual that must always be considered by the state. Thus, realizing national and regional food security has a strategic function which is closely related to matters involving social security, political-economic stability, national security, and national independence (Ministry of Agriculture and Food Security Agency, 2017). In the context of fulfilling strategic food, food security is currently a global issue that reflects the concern of all countries to try to improve, achieve and maintain it in a sustainable manner. The global agreement, as stated in the Millennium Development Goals, confirms that by 2015 every country agrees to reduce poverty and hunger (Gitz, et al., 2016)

Food scarcity is the main threat from the economic crisis, which has raised concerns for many countries that depend on imported food and the threat of local famine due to difficulties in providing food for their people (Mc-Carthy et al., 2018). Looking at the data on the availability of strategic

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food (Table 1), although the availability of strategic food tends to increase, there are still commodities that fluctuate every year. This figure is still far from what the government expects to achieve self-sufficiency in food.

Table 1. Availability Data of Strategic Food Commodities for 2013-2017

Commodity	Availability per year (000 ton)					Growth per year (%)	
	2013	2014	2015	2016	2017	13 - 17	13 - 17
Rice	40,820	41,491	43,949	45,922	46,792	3.49	1.90
Corn	14,495	14,956	9,654	11,250	12,782	-0.53	13.62
Sugar	5,393	5,4036	6,156	6,409	3,283	-7.66	-48.77
Shallot	650	793	734	854	889	8.75	4.12
Chili	1,760	1,925	1,990	2,053	1,958	2.82	-4.62
Soy bean	2,276	2,517	3,016	2,721	2,076	-0.77	-23.72
Beef	5.13	-5.13	-5.13	-5.13	5.13	-5.13	-5.13

Source: Food Security Agency, 2017

Wahyuni et al. (2016), argues that food security in an area can be seen from purchasing power, food availability, and consumption levels of the population. The level of food consumption can provide an overview of the health condition of the population in an area in terms of nutritional conditions. The indicators used for consumption analysis are measures of the adequacy of energy and protein consumption. Energy and protein consumption refers to the 2012 National Food and Nutrition Division (WNPG), namely the recommended adequacy of energy consumption is 2,150 kcal/person/day and adequate protein consumption is 57 g/person/day.

Changes in food commodity prices can be the biggest contributor to the inflation rate because with a large enough population, the demand for food will be very high. But sometimes supply can't keep up with demand, which in turn pushes up the inflation rate (Ball, R. J., 2017). Ministry of Trade (2015) stating that stable food prices are in the common interest of producers and consumers as well as the government. In order for food production to be sustainable, and the community's nutritional needs to be met, the government must protect the community and farmers from price fluctuations such as lower prices during the main harvest season and higher prices when outside harvest. The price stabilization policy is one of the government's efforts. Unstable prices affect producers (a disincentive), consumers and inflation expectations. The increase in domestic agricultural commodity prices is thought to be due to the scarcity of these commodities on the world market (Elleby et al., 2020). Food Security Agency (2019) stated that East Java Province is one of the national rice barns. However, based on the national food security and vulnerability maps in 2015, ten districts in East Java are included in the temporary food security district group indicating that food security needs to be improved, especially in the distribution of food security. Food security in Indonesia is categorized into three levels, the most vulnerable to food security and moderate food security and relative food security, but the region in East Java is divided into two categories, namely moderate food security and relative food security. In an effort to improve food security a study of elasticity is important. Elasticity studies can be used for policy making in efforts to increase food security.

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Much research has been done on the elasticity of demand for food in East Java, but there is no research specifically on strategic food. Analysis of strategic food demand elasticity in East Java needs to be done. Given that East Java is currently a province that has the largest absolute number of poor people, reaching 4.7 million people in 2016 (Mayasari et al., 2018). The share of food consumption expenditure for poor households in East Java always dominates their total expenditure with a relatively high percentage, which is always above 60%. So that price increases in food commodities will greatly affect the purchasing power of poor households. Moreover, empirically inflation in East Java from year to year is relatively dominated by food commodities. Thus, price changes in food commodities will have a large influence and can escalate inflation in other commodities as revealed by Satria & Mayasari (2019) and ultimately inflation will affect the level of household welfare, especially for poor households. Fujii (2013) conducted a simulation in his research and found that inflation in food commodities not only made poor households food vulnerable but also made poor households worse off.

This study aims to analyze the share of household expenditure on strategic food prices, the factors that influence the share of household expenditure on strategic food, price elasticity (Own price elasticity and Cross price elasticity) and income elasticity on strategic food consumption. The research was limited to six strategic commodities, namely: rice, corn, beef, shallots, chilies and sugar which had never been done in East Java.

RESEARCH METHODS

Data Collection Method

This study uses a quantitative approach with descriptive statistical analysis techniques and econometrics. The data used in this study are cross section secondary data derived from the March 2016 National Socioeconomic Survey (Susenas) in East Java Province and processed using computer aids (software) SAS. The data obtained from Susenas includes employment, income, expenses, and consumption. As well as various social, economic and demographic characteristics of Indonesian households.

Commodities taken in this study include strategic food commodities, namely: rice, corn, sugar, red chilies, shallots, and meat. Since prices actually paid by households are not reported in Susenas, unit prices are obtained by dividing expenses by quantity. Household data is 29,479. This data is household data in East Java.

Data Analysis

This study used a quantitative descriptive analysis method on Cross Section data from Susenas in March 2016. Analysis to identify household consumption preferences for food commodities (rice, corn, meat, shallots, chilies, and sugar) was performed using Microsoft Excel calculations. The analysis used to estimate the LA/AIDS model demand system is SUR.

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Analysis of household preferences for food consumption is calculated using the following formula (Muhammad et al., 2011):

$$w_i = \frac{b_i}{x} \times 100\% = \frac{p_i . q_i}{\sum p_i . q_i} \times 100\%$$

Information:
i : 1,2,...,6
i : 1 (rice), 2 (corn), 3 (beef), 4 (shallot), 5 (chili), 6 (sugar)
w_i : Proportion of commodity expenditure i (%)
b_i : Commodity expenditure i (Rp)
x : Total expenditure on staple foods (Rp)
p_i : Commodity prices i (Rp)
q_i : Commodity purchase quantity (kg)

Analysis of Food Demand Estimation in East Java, Indonesia

The demand estimation model used in this study is the Linear Approximation/Almost Ideal Demand System (LA/AIDS) model. The LA/AIDS model is a demand model derived from Marshallian demand but in proportion to expenditure (Anindita et al., 2022). Each demand system consists of six model equations that describe the six commodities analyzed (rice, corn, beef, shallots, chilies, and sugar).

Demand Model Specifications

The formulation of the LA/AIDS model used in this study is as follows:

1. Mathematical models
   w-kel$_i$ = f (estimated prices for commodity groups, total spending/index, stone prices, number of household members)
2. Econometric Models
   The LA/AIDS model using expenditure share is formulated as follows:

$$\omega_i = \alpha_i + \sum_j \gamma_{ij} lnP_j + \beta_j ln\left[\frac{X}{P}\right] + \varepsilon_i$$

The use of the LA/AIDS model in research according to the variables studied is further described as follows:

$$\omega_1 = \alpha_{11} + \gamma_{11}LnP_1 + \gamma_{12}LnP_2 + \gamma_{13}LnP_3 + \gamma_{14}LnP_4 + \gamma_{15}LnP_5 + \gamma_{16}LnP_6 + \beta_1 Ln\left(\frac{X}{P}\right) + \delta_1 LnART$$

$$\omega_2 = \alpha_{21} + \gamma_{21}LnP_1 + \gamma_{22}LnP_2 + \gamma_{23}LnP_3 + \gamma_{24}LnP_4 + \gamma_{25}LnP_5 + \gamma_{26}LnP_6 + \beta_2 Ln\left(\frac{X}{P}\right) + \delta_2 LnART$$

$$\omega_3 = \alpha_{31} + \gamma_{31}LnP_1 + \gamma_{32}LnP_2 + \gamma_{33}LnP_3 + \gamma_{34}LnP_4 + \gamma_{35}LnP_5 + \gamma_{36}LnP_6 + \beta_3 Ln\left(\frac{X}{P}\right) + \delta_3 LnART$$

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$$\omega_4 = \alpha_{41} + \gamma_{41}LnP_1 + \gamma_{42}LnP_2 + \gamma_{43}LnP_3 + \gamma_{44}LnP_4 + \gamma_{45}LnP_5 + \gamma_{46}LnP_6 + \beta_4 Ln\left(\frac{X}{P}\right) + \delta_4 LnART$$

$$\omega_5 = \alpha_{51} + \gamma_{51}LnP_1 + \gamma_{52}LnP_2 + \gamma_{53}LnP_3 + \gamma_{54}LnP_4 + \gamma_{55}LnP_5 + \gamma_{56}LnP_6 + \beta_5 Ln\left(\frac{X}{P}\right) + \delta_5 LnART$$

$$\omega_6 = \alpha_{61} + \gamma_{61}LnP_1 + \gamma_{62}LnP_2 + \gamma_{63}LnP_3 + \gamma_{64}LnP_4 + \gamma_{65}LnP_5 + \gamma_{66}LnP_6 + \beta_6 Ln\left(\frac{X}{P}\right) + \delta_6 LnART$$

Information:

w_{1-}	: The proportion of food expenditure i
$P_1 - P_6$	: Price of rice, price of corn, price of beef, price of shallot, price of chilli, price of sugar
x	: Total expenditure on consuming food (Rp)
p*	: Indeks harga stone, where $\ln p^* = \Sigma w_i . \ln p_i$
μ	: Error term
α, d	: Intersep parameters
β	: Expenditure parameters
γ	: Price parameter
ART	: Number of household member (orang)
Expd	: Household expenditure (Rp/month)
i, j	: 1 (rice), 2 (corn), 3 (beef), 4 (shallot), 5 (chili), 6 (sugar)

Then, the formula for the proportion of expenditure (budget share) of each household for commodity group-i (wi) is:

$$w_i = \frac{\sum_{j=1}^{ji} e_j}{\sum_{i=1}^{j} e_i}$$

Analysis of the Impact of Changes in Prices and Income on Demand

Measuring changes in demand can be done through analysis of the elasticity of demand because changes in demand for commodities are caused by changes in price changes of these commodities (own price elasticity), due to changes in consumer income (income elasticity), and as a result of changes in the prices of other commodities (cross elasticity). The elasticity of demand can be analyzed using the Marshallian and Hicksian demand function approach. (Basarir, A. , 2013) suggests that elasticity can be calculated using the following formula:

1. Marshallian elasticity, where there is an income effect derived from total expenditure, so that:
   Marshallian price elasticity value:

$$\in_{ii}^{M} = -1 + \frac{\gamma_i}{w_i} - \beta_i$$

   Marshallian cross elasticity values:

$$\in_{ij}^{M} = \frac{\gamma_{ij}}{w_i} - \beta_i \frac{w_j}{w_i}$$

2. Hicksian elasticity only has the effect of expenditure prices, so the value of elasticity is known by:

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Hicksian price elasticity value:

$$\in_{ii}^{H} = -1 + \frac{\gamma_i}{w_i} + w_i$$

Hicksian cross elasticity values:

$$\in_{ij}^{H} = \frac{\gamma_{ij}}{w_i} + w_j$$

3. Expenditure elasticity is obtained from:

$$\eta_i = \frac{\partial\ log\ q_i}{\partial\ log\ x} = 1 + \left(\frac{1}{w_i}\right)\left(\frac{\partial w_i}{\partial \log x}\right) = 1 + \left(\frac{\beta_i}{w_i}\right)$$

4. The elasticity of the household spending margin is obtained from

$$m_i = \eta_i . w_i$$

Information:

$\in_{ii}^{M}$: Marshallian price elasticity
$\in_{ij}^{M}$: Marshalian cross price elasticity
$\in_{ii}^{H}$: Hicksian price elasticity
$\in_{ij}^{H}$: Hicksian cross price elasticity
η_i : Expenditure elasticity
m_i : Expenditure margin elasticity
w_i : Budget share
γ_{i-j} : Parameters of price commodity
β_{i-j} : Parameters of expenditure
i : Commodity as dependent variables
j : Commodity as independent variables.

RESULT AND DISCUSSION

Household Expenditure Share Preference for Strategic Food in East Java

The proportion of strategic food consumption expenditure can show the tendency (preference) of consumers in consuming strategic food (Sa'diyah et al., 2018). The percentage of consumer spending on strategic food is influenced by two things, namely: price and amount of strategic food consumption. Table 2 displays the results of the analysis of household consumption preferences in East Java as a whole for strategic foods.

Table 2. Expenditure Share Preference for Food Commodities

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Commodity	Expenditure share (%)	Average Consumption (kg/household)	Price (Rp/kg)
Rice	65,3	5.45	7,954
Corn	2,5	0.37	4,987
Beef	3,5	0.04	104,007
Shallot	7,4	2.25	2,547
Chilli	8,3	0.38	20,603
Sugar	11	6.16	1,044

Source: Author's calculations from National Socioeconomic Survey

Strategic food commodities, especially rice, are a source of food for households in East Java. The value of the proportion of expenditure can be seen in table 2. Household consumption of rice is the highest compared to commodities other than rice. This condition can be seen in the high share value of rice expenditure. This condition indicates that rice is the preferred commodity for households in East Java. These findings are in line with what was stated by (Rachman & Ariani, 2016) although diversification efforts have been initiated since the 1960s, so far they have not worked as expected. The local food pattern seems to be abandoned, changing to a rice and noodle pattern. The quality of the food is also still low, less diverse, still dominated by food sources of carbohydrates, especially from grains.

Table 2 also shows that corn is the commodity that is the least desirable for households in general in East Java. The data shows that corn consumption is only 0.37 kg/week/household. If the average number of household members in East Java is 3, then the average corn consumption is only 0.12/capita/week. Which means that corn is not a preferred commodity for households in East Java. Even though the corn commodity should be a food substitute for rice which alternatively contains a source of carbohydrates. The highest share of household expenditure in East Java was rice, which was 0.653%. Meanwhile, beef is a commodity that households cannot buy (Kharisma et al., 2020). The average consumption of beef for households in East Java is 4 grams per day per household. The 2016 Susenas data shows that the average number of household members in East Java is 3 people. So it can be seen that the average consumption of beef in East Java households is 1.33 grams per person per day. Indonesia is the 8th lowest country in the world for meat consumption, which is 2.2 kg/year or 0.006 kg/day or 0.6 gram/day. This amount is very less than recommended by WHO, which is 50-70 grams/day.

The Estimation of Parameter Households In East Java

The household strategic food demand model in East Java showed in table 3. All models meet the assumptions of symmetry, homogeneity, and adding up.

Table 3. The Estimation of Parameter For Rural Households

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Variable	Rice	Corn	Beef	Shallot	Chili	Sugar
Intercept	0.030*	0.142*	-1.292*	0.745*	-0.715*	0.901*
The price of rice	-0.025*	0.005*	-0.083*	-0.096*	-0.012*	-0.073*
The price of corn	0.027*	0.027*	-0.027*	-0.005*	-0.043*	-0.001*
The price of beef	-0.055	-0.004*	-0.010*	0.057*	0.081*	0.027*
The price of shallot	-0.003	-0.002*	0.057*	0.0:42*	-0.004*	0.006*
The price of chili	-0.042*	-0.001*	0.031*	-0.004*	0.055*	0.003*
The price of sugar	-0.003*	-0.001*	0.027*	0.006*	0.020*	0.020*
Total expenditure	-0.081*	-0.015*	0.076*	0.060*	0.083*	0.034*
The number of Household Member	0.204*	0.006*	-0.129*	-0.041*	-0.042*	0.010*
R^2			0.671			

Source: Author's calculations from National Socioeconomic Survey

Table 3 shows the prices of related commodities, prices of other commodities, total expenditure statistically influencing the share of strategic food expenditures in rural households. R^2 value of 0.671 indicates that 67% of the influence of the independent variables can be explained in the model. The results of the analysis show the variable parameter coefficients of commodity prices related to the commodity group rice, corn, shallot, chili and sugar are positive. The low diversification of food in East Java causes the price variables for rice, shallots and sugar to be positive, which means that even if prices increase, consumers will still buy rice as their staple food. Meanwhile, corn is still purchased as animal feed. Shallots and sugar are indeed strategic foods that have not been diversified. This finding supports the previous findings that have been made by (Sa'diyah et al., 2019) for poor rural households and non-poor households in rural areas. This positive effect can be interpreted as an increase in prices of related commodities which will increase the value of the expenditure part of the commodity rice, corn, shallots, chilies and sugar. This positive effect can be interpreted as an increase in commodity prices related to it will increase the value of the expenditure share of these commodities. This happens because in the value of expenditure shares there is a value of the variable price, so that when the proportion of the price increase is greater than the decrease in consumption, it can increase the share of expenditure (Sombilla et al., 2013). While the variable coefficient value of related beef is negative, this means that the increase in price of related beef will have a significantly higher effect on reducing beef consumption. This research supports the findings (Milford et al., 2019). This condition also occurs in East Java, as a result of low food diversification

The coefficient parameters of other commodity price variables vary in value, some are positive and some are negative (Table 2). Other commodity price variables that have a negative sign can mean that an increase in the price of other commodities will reduce the share of commodity expenditure analyzed, and vice versa if the variable value of other commodities has a positive sign (Onyinbo et al., 2013). An increase in the price of beef, shallots, chilies and sugar will reduce the share of rice expenditure. While a one percent increase in corn prices will increase the share of rice expenditure by 0.0095%. In the commodity of corn, the price increase of beef, onion, chili and sugar will reduce the share of corn expenditure. While an increase in the price of rice will increase the share of corn expenditure even though the value is very small. This condition illustrates that in east java households rice and corn are still substitute commodity. The average household expenditure for food in East Java is Rp. 557 thousand / capita / month. Lower than the average household expenditure for

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food nationally, namely Rp. 622.8 thousand/capita/month. This condition causes that if there is an increase in the price of beef, shallots, chilies and sugar, households must reduce rice consumption, so that all the staple foods needed are purchased.

The total expenditure variable is negative for rice and corn commodities. The negative sign indicates if an increase in total expenditure will decrease the proportion of expenditure for each commodity, conversely if the total expenditure variable is positive (Gabriel et al., 2016). Table 1 shows the expenditure coefficient for shallot, chili, and sugar is positive which means this commodity is a necessity commodity, given that if the expenditure coefficient is less than zero, the share of the budget decreases when total expenditure increases (Hamzah, 2022). Shallots, chilies and sugar are strategic foods which are urgently needed by households in East Java. There is no substitute for this commodity, so once there is an increase in income, the amount of consumption will increase.

The variable number of household members negatively affects beef, shallot, and chilli commodities. This condition is caused by rural households having a limited income, so the higher the number of family members, the household will reduce consumption of beef, onion, and chili. The increase in the number of household members causes spending on purchases of food sources of carbohydrate (rice, corn) relatively high, so that the consequences are done by reducing the consumption of beef, shallot, and chili. This is also reinforced by the variable coefficient value of the number of household members that is positive for rice and corn. This means that the higher the number of household members, the share of expenditure on rice and corn also increases. This is in line with the results of the study (Nendissa et al., 2021) which stated that increasing household members will reduce animal food consumption in rural households.

Effect of Changes in Food Prices and Income on Food Demand

Expenditure elasticity and marginal expenditure share are presented in Table 4. Expenditure elasticity values for East Java's strategic commodities (rice, corn, beef, shallots, chilies and sugar) are positive. Rice, shallot, beef and chili have an elasticity value greater than one. a 1% increase in income will increase beef consumption by more than 1%. While rice, corn, shallots, chilies and sugar have an expenditure elasticity value of less than 1. A 1% increase in income will increase the consumption of corn and sugar by less than 1%. If one looks at this condition, it shows that beef is an item with the highest expenditure elasticity value, thus beef is a luxury item for East Java households. The elasticity value of beef is 1.16710. This means that an increase in household income in East Java by one percent will increase beef consumption by 1.16710%. This condition illustrates that beef has not been fully purchased by households in East Java and is still a superior comodity.

Table 4. Expenditure Elasticity and Marginal Expenditure Share

Commodity	Expenditure Elasticity	Marginal Expenditure Share
Rice	1.06353	0.70703
Corn	0.79808	0.02083
Shallot	1.16710	0.08800
Beef	1.70144	0.06142
Gula Pasir	0.70606	0.07929
Cabai	1.07202	0.09134

Source: Author’s calculations from National Socioeconomic Survey

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The marginal expenditure share is the multiplication between the expenditure elasticity and the budget share for each strategic food category. The results of the calculation of the marginal expenditure share show that East Java households will allocate their income more proportionally to corn, shallots, beef, sugar and chilies.

Estimates of price elasticity and cross-elasticity both in Marshallian and Hicksian terms are presented in table 5. The commodity variable own-price elasticity is negative in Marshallian terms and has a negative sign and is also positive in Hicksian terms. If it is negative, it means that if a commodity experiences a price increase, then the quantity demanded of that commodity will decrease and vice versa if it is positive, it means that a commodity has a price increase. The value of self-price elasticity both in Marshallian and Hicksian terms is more than one except for Hicksian, namely the commodities of rice, sugar and chili which have a value of less than one. This value indicates that rice, corn, shallots, beef, sugar, and chilies are elastic commodities. Furthermore, these 6 commodities are elastic to price changes. When the value of elasticity is less than one, if there is a change in the price of a commodity, the percentage demanded will be smaller than the amount of the price change. Meanwhile, rice, granulated sugar and chili are hicksian inelastic commodities. The Marshalian price elasticity for each commodity rice, corn, shallots, beef, chilies and sugar is (-1.08119; -1.14454; -1.34377; -1.19624; -1.02193; - 1.01992) means that an increase in the commodity prices of rice, corn, beef, shallots, chilies and sugar by one percent will reduce the demand for rice, corn, beef, shallots, chilies and sugar by 1.08119 percent respectively. 1.14454 percent, 1.34377 percent, 1.19624 percent, 1.02193 percent, and 1.01992 percent

Cross price elasticity is an elasticity that shows the relationship between two different commodities. Cross price elasticity is divided into two, if the results show a negative sign, then the relationship between these commodities is complementary. While the positive sign on the value of elasticity, will show the substitution relationship between commodities.

Table 5. Price Elasticity and Cross Price Elasticity

Commodity	Rice	Corn	Shallot	Beef	Sugar	Chilli
Uncompensated (Marshallian)						
Rice	**-1.08119**	-0.04062	-0.04375	-0.04125	-0.04609	-0.04437
Corn	-0.01557	**-1.14454**	-0.13458	-0.14252	-0.12713	-0.13261
Shallot	-0.44225	-0.33553	**-1.34377**	-0.33720	-0.34993	-0.34540
Beef	-0.63723	-0.18922	-0.22380	**-1.19624**	-0.39000	-0.23068
Sugar	-0.49773	-0.68547	-0.67098	-0.68253	**-1.02193**	-0.66810
Chilli	0.17931	-0.22530	0.22175	0.22458	0.21910	**-1.01992**
Compensated (Hicksian)						
Rice	**-0.37416**	-0.01286	-0.03644	-0.00286	0.07334	0.04624
Corn	0.51499	**-1.12371**	-0.07441	-0.11371	-0.03751	-0.06461
Shallot	0.33363	-0.30507	**-1.25577**	-0.29507	-0.21887	-0.24597
Beef	0.49389	-0.14481	-0.09551	**-1.13481**	-0.05861	-0.08571
Sugar	0.64394	0.00524	0.05454	0.01524	**-0.90856**	0.06434
Chilli	0.65102	0.11130	0.16060	0.12130	0.19750	**-0.92858**

Source: Author's calculations from National Socioeconomic Survey

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The Marshalian cross-price elasticity shows that rice has no substitution relationship with strategic food. and has a complementary relationship to corn, beef shallots, sugar and chilies. Likewise with the corn commodity does not have a relationship of substitution with any commodity. but has a complementary relationship with the variables corn, beef shallots, sugar and chili. The price elasticity values of all commodities (corn, shallots, beef, chilies, and sugar) are negative, which means that if there is an increase in the price of rice, there will be a decrease in demand for the other five (complementary) commodities. This phenomenon indicates that in households in East Java the six commodities are consumed simultaneously.

The Hicksian cross-price elasticity shows that rice has a substitution relationship with sugar and chilies, and has a complementary relationship with corn, shallots and meat. Corn has a substitution relationship with rice, and has a complementary relationship with shallots, beef, sugar and chilies. In the rice commodity, the cross elasticities for sugar and chilies are positive and for corn, shallots and meat are negative. This means that if there is an increase in the price of rice, there will be an increase in the consumption of sugar and chilies, and a decrease in the consumption of corn, shallots and beef. This is not in accordance with the government's expectations that corn should be a food substitute for rice.

CONCLUSION AND SUGGESTION

Based on the research results, it can be concluded that rice is the preferred commodity for households in East Java, because it is known that the share of expenditure is the highest. The share of strategic food expenditure in East Java is significantly influenced by the price of the commodity itself, the price of other commodities and the amount of income significantly. The elasticity of commodity prices shows an elasticity value of less than one, namely rice, corn, shallots, beef, sugar, and chili indicating that commodities are elastic to the price of the commodity itself. For the cross elasticity of each commodity also shows different results. The negative cross elasticity value indicates the nature of the complementary relationship. Meanwhile, the results of cross elasticity with a positive sign indicate a substitutional relationship. Income elasticity shows that corn and sugar are normal goods. Corn and granulated sugar have an income elasticity value below one, which means that these commodities are normal goods and are inelastic. Meanwhile, rice, shallots, beef and chilies have an income elasticity value of more than one, which means that these commodities are income elastic.

The policy of diversifying rice food with local food (eg corn) is the right policy as an implication of this research. But this policy is still difficult to realize. The results of the study both in Marshalian and Hicksian terms rice have a complementary relationship with maize. For this reason, the campaign to diversify rice with local food needs to be continued.

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