The Structure of Strategic Food Demand in Indonesian Urban: an Application of a Linearized Almost Ideal Demand System (LA/AIDS)

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Abstract. Indonesia's strategic food refers to a group of food products that have an important role in meeting national food needs. This strategic food is the focus of government attention because of its significant impact on food security, the economy and social stability. The research aims to analyze urban household preferences for strategic food, analyze estimates of urban household demand for strategic food, and analyze the impact of changes in prices and urban household expenditure on strategic food demand. The research uses Susenas data for 2023 specifically for urban households. Strategic Foods are grouped into rice, corn, soybeans, shallot, chilies, poultry meat, poultry eggs, ruminant meat, consumer sugar and fish. Analysis of household preference data was carried out using expenditure shares. Demand estimates were analyzed using the LA/AIDS model with the SUR approach. The results of the analysis show that the highest share of urban household expenditure is for rice. Beef is still a luxury comodity with elastic price elasticity. Poultry meat, poultry eggs and ruminant meat are commodities that are substitutes for each other.

1 INTRODUCTION

Designing effective policies for strategic food fulfillment often requires grouping households based on their rural or urban status. (Kementerian Pertanian, 2019). Through PP number 59 of 2022, the Indonesian government stipulates that urban areas are a form of area with certain boundaries whose residents have main activities in the industrial, service, trade or non-agricultural sectors. (Muryanti, M.A., 2022). Strategic food fulfillment policies need to take into account the location of urban and rural households because the needs and challenges of each region are different. (Prabowo, R. , 2010). Urban households typically face accessibility issues and higher food prices, while rural households rely more on local production and may face infrastructure challenges. Therefore, strategies tailored to local conditions will be more effective in ensuring food availability, affordability and security for all groups.

The number of Indonesian households in 2022 is 70,628,952, which are spread into two groups of residential areas, namely urban with 39,655,323 households and rural with 30,973,629 households. The fulfillment of strategic food for urban households has been widely attempted, including the development of urban farming, strengthening the food distribution chain, and food subsidy programs. But Data (Indonesia, 2019) shows the expected food pattern (PPH) score of urban households is still 86.9%. This condition shows that in urban households, food consumption patterns are still not diverse and nutritionally balanced, as seen from the failure to achieve the ideal PPH score of 100.

Strategic food research in Indonesia has been conducted by several researchers. Among them by (Firdaus, M. , 2021) with the research title Disparity in strategic food prices before and during the Covid-19 pandemic, (Faradilla, C., Marsudi, E., & Baihaqi, A. , 2021) with the title Statistical Analysis of Food Security Against Changes in Strategic Food Commodity Prices in Indonesia, (Ridhwan, M. M., Indawan, F., & Karlina, I., 2012) with the title Interregional Trade, Distribution, Transportation, and Management of Strategic Food Commodity Stocks in Indonesia. Comprehensive research on 11 strategic commodities (rice, corn, soybeans, onions, chilies, poultry, poultry eggs, ruminant meat, consumption sugar, cooking oil, and fish has never been conducted. This study was designed to see the grouping of 11 strategic commodities in Indonesia.

The study of Strategic Food Structure in Urban Households in Indonesia aims to provide empirical data on factors that influence the demand for strategic food in urban households, the influence of prices and income of urban households on the consumption of strategic food in urban households, and the elasticity of demand for strategic food in urban households in Indonesia. The results of the study are expected to be used as a reference for policy making in meeting the diverse consumption of strategic food in urban households.

2. METHOLOGY

Method of collecting data

Research focuses on eleven strategic food, namely: rice, corn, soybean, shallot, chilli, poultry, eggs, beef, sugar, cooking oil, and fish. Since prices actually paid by households are not reported in Susenas data, unit prices are obtained by dividing expenses by quantity. Household data is 141,591. This research is on a national scale with the boundaries of the research area being the territory of Indonesia. Related to the research title, several important things are the focus of research, namely: food demand, food price elasticity, cross price elasticity, income elasticity,and the impact of price changes on food demand.

Specification of the demand function

The demand parameter estimates of interest are the own-price, cross-price and income elasticities of demand. These values indicate the percentage change in the quantity demanded of a particular strategic food type to a one percent change in the price of that strategic food type, in the prices of substitute strategic food types, and in consumer incomes, respectively. The analysis uses the LA-AIDS model (Mustafa, G., Huo, W., Pervaiz, A., Ullah, M. R., & Zulfiqar, M. (, 2022); (Siddique, 2020); (Anindita, R., Amalina, F., Sa'diyah, A. A., Khoiriyah, N., & Muhaimin, A. W., 2022); (Siami-Namini, S., 2017); (Ullah, I., & Jan, A. U., 2016); (Zhou, X., 2015)

The LA/AIDS model formulation used in the study is described as follows: (Delport, M., Louw, M., Davids, T., Vermeulen, H., & Meyer, F. , 2017)

1. Mathematical models

   w-kel$_i$ = f (harga estimasi kelompok komoditi, total pengeluaran/indeks, harga stone, jumlah ART, IMR)

2. Econometric Models

   The LA/AIDS model using expenditure share is formulated as follows (Green, R., & Alston, J. M., 1990) :

$$\omega_i = \alpha_i + \sum_j \gamma_{ij} lnP_j + \beta_j ln\left[\frac{X}{P}\right] + \varepsilon_i \quad (1)$$

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

$$\omega_1 = \alpha_{11} + \gamma_{11}LnP_1 + \gamma_{12}LnP_2 + \gamma_{13}LnP_3 + \gamma_{14}LnP_4 + \gamma_{15}LnP_5 + \gamma_{16}LnP_6 + \gamma_{17}LnP_7 + \gamma_{18}LnP_8 + \gamma_{19}LnP_9 + \gamma_{110}LnP_{10} + \gamma_{111}LnP_{11} + \beta_1 Ln\left(\frac{X}{P}\right) + \delta_1 LnART \quad (2)$$

$$\omega_2 = \alpha_{21} + \gamma_{21}LnP_1 + \gamma_{22}LnP_2 + \gamma_{23}LnP_3 + \gamma_{24}LnP_4 + \gamma_{25}LnP_5 + \gamma_{26}LnP_6 + \gamma_{27}LnP_7 + \gamma_{28}LnP_8 + \gamma_{29}LnP_9 + \gamma_{210}LnP_{10} + \gamma_{211}LnP_{11} + \beta_2 Ln\left(\frac{X}{P}\right) + \delta_2 LnART \quad (3)$$

$$\omega_3 = \alpha_{31} + \gamma_{31}LnP_1 + \gamma_{32}LnP_2 + \gamma_{33}LnP_3 + \gamma_{34}LnP_4 + \gamma_{35}LnP_5 + \gamma_{36}LnP_6 + \gamma_{37}LnP_7 + \gamma_{38}LnP_8 + \gamma_{39}LnP_9 + \gamma_{310}LnP_{10} + \gamma_{311}LnP_{11} + \beta_3 Ln\left(\frac{X}{P}\right) + \delta_3 LnART \quad (4)$$

$$\omega_4 = \alpha_{41} + \gamma_{41}LnP_1 + \gamma_{42}LnP_2 + \gamma_{43}LnP_3 + \gamma_{44}LnP_4 + \gamma_{45}LnP_5 + \gamma_{46}LnP_6 + \gamma_{47}LnP_7 + \gamma_{48}LnP_8 + \gamma_{49}LnP_9 + \gamma_{410}LnP_{10} + \gamma_{411}LnP_{11} + \beta_4 Ln\left(\frac{X}{P}\right) + \delta_4 LnART \quad (5)$$

$$\omega_5 = \alpha_{51} + \gamma_{51}LnP_1 + \gamma_{52}LnP_2 + \gamma_{53}LnP_3 + \gamma_{54}LnP_4 + \gamma_{55}LnP_5 + \gamma_{56}LnP_6 + \gamma_{57}LnP_7 + \gamma_{58}LnP_8 + \gamma_{59}LnP_9 + \gamma_{510}LnP_{10} + \gamma_{511}LnP_{11} + \beta_5 Ln\left(\frac{X}{P}\right) + \delta_5 LnART \quad (6)$$

$$\omega_6 = \alpha_{61} + \gamma_{61}LnP_1 + \gamma_{62}LnP_2 + \gamma_{63}LnP_3 + \gamma_{64}LnP_4 + \gamma_{65}LnP_5 + \gamma_{66}LnP_6 + \gamma_{67}LnP_7 + \gamma_{68}LnP_8 + \gamma_{69}LnP_9 + \gamma_{610}LnP_{10} + \gamma_{611}LnP_{11} + \beta_6 Ln\left(\frac{X}{P}\right) + \delta_6 LnART \quad (7)$$

$$\omega_7 = \alpha_{71} + \gamma_{71}LnP_1 + \gamma_{72}LnP_2 + \gamma_{73}LnP_3 + \gamma_{74}LnP_4 + \gamma_{75}LnP_5 + \gamma_{76}LnP_6 + \gamma_{77}LnP_7 + \gamma_{78}LnP_8 + \gamma_{79}LnP_9 + \gamma_{710}LnP_{10} + \gamma_{711}LnP_{11} + \beta_7 Ln\left(\frac{X}{P}\right) + \delta_7 LnART \quad (8)$$

$$\omega_8 = \alpha_{81} + \gamma_{81}LnP_1 + \gamma_{82}LnP_2 + \gamma_{83}LnP_3 + \gamma_{84}LnP_4 + \gamma_{85}LnP_5 + \gamma_{86}LnP_6 + \gamma_{87}LnP_7 + \gamma_{88}LnP_8 + \gamma_{89}LnP_9 + \gamma_{810}LnP_{10} + \gamma_{811}LnP_{11} + \beta_8 Ln\left(\frac{X}{P}\right) + \delta_8 LnART \quad (9)$$

$$\omega_9 = \alpha_{91} + \gamma_{91}LnP_1 + \gamma_{92}LnP_2 + \gamma_{93}LnP_3 + \gamma_{94}LnP_4 + \gamma_{95}LnP_5 + \gamma_{96}LnP_6 + \gamma_{97}LnP_7 + \gamma_{98}LnP_8 + \gamma_{99}LnP_9 + \gamma_{910}LnP_{10} + \gamma_{911}LnP_{11} + \beta_9 Ln\left(\frac{X}{P}\right) + \delta_9 LnART \quad (10)$$

$$\omega_{10} = \alpha_{101} + \gamma_{101}LnP_1 + \gamma_{102}LnP_2 + \gamma_{103}LnP_3 + \gamma_{104}LnP_4 + \gamma_{105}LnP_5 + \gamma_{106}LnP_6 + \gamma_{107}LnP_7 + \gamma_{108}LnP_8 + \gamma_{109}LnP_9 + \gamma_{1010}LnP_{10} + \gamma_{1011}LnP_{11} + \beta_{10} Ln\left(\frac{X}{P}\right) + \delta_{10} LnART \quad (11)$$

$$\omega_{11} = \alpha_{111} + \gamma_{111}LnP_1 + \gamma_{112}LnP_2 + \gamma_{113}LnP_3 + \gamma_{114}LnP_4 + \gamma_{115}LnP_5 + \gamma_{116}LnP_6 + \gamma_{117}LnP_7 + \gamma_{118}LnP_8 + \gamma_{119}LnP_9 + \gamma_{1110}LnP_{10} + \gamma_{1111}LnP_{11} + \beta_{11} Ln\left(\frac{X}{P}\right) + \delta_{11} LnART \quad (12)$$

Where:

w_{1-11} : the proportion of food expenditure i

$P_1 - 1$: Prices of rice, corn, soybean, shallot, chilli, poultry, eggs, beef, sugar, cooking oil, and fish.

x : Total spending on food consumption (Rp)

p* : Stone price index, where $\ln p^* = \Sigma w_i . \ln p_i$

μ : *error term*

α, d : parameter intersep

β : expenditure parameters

γ : price parameters

ART : number of household members (people)

Expd : Household expenditure (Rp/month)

i, j : 1 (rice), 2 (corn), 3 (soybean), 4 (shallot), 5 (chilli), 6 (poultry), 7 (eggs), 8 (beef), 9 (sugar), 10 (cooking oil), 11(fish)

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 price elasticity). The elasticity of demand can be analyzed using the Marshallian and Hicksian demand function approach (Deaton, A., 1990) 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 own price elasticity value:

   $$\epsilon_{ii}^{M} = -1 + \frac{\gamma_i}{w_i} - \beta_i \quad (13)$$

   Marshallian cross price elasticity values:

   $$\epsilon_{ij}^{M} = \frac{\gamma_{ij}}{w_i} - \beta_i \frac{w_j}{w_i} \quad (14)$$

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

   Hicksian own price elasticity value:

   $$\epsilon_{ii}^{H} = -1 + \frac{\gamma_i}{w_i} + w_i \quad (15)$$

   Hicksian cross price elasticity value:

   $$\epsilon_{ij}^{H} = \frac{\gamma_{ij}}{w_i} + w_j \quad (16)$$

3. Expenditure elasticity is obtained from:

   $$\eta_i = \frac{\partial \log q_i}{\partial \log x} = 1 + \left(\frac{1}{w_i}\right)\left(\frac{\partial w_i}{\partial \log x}\right) = 1 + \left(\frac{\beta_i}{w_i}\right) \quad (17)$$

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

$m_i = \eta_i . w_i$: .... (18)

Where:

$\in_{ii}^{M}$: Marshallian Own Price Elasticity

$\in_{ij}^{M}$: Marshallian Cross Elasticity

$\in_{ii}^{H}$: Hicksian Own Price Elasticity

$\in_{ij}^{H}$: Hicksian Cross Elasticity

η_i : Elastisitas Pengeluaran

m_i : Elastisitas Margin Pengeluaran

w_i : budget share

γ_{i-j} : commodity price parameters

β_{i-j} : Expenditure parameters

i : commodity as the dependent variable

j : commodity as independent variable

3. RESULT

Parameter Estimation for Strategic Food Expenditure Share

Estimates of the share of Indonesian household expenditure on strategic food are presented in Table 1. Parameter estimates of the share of Indonesian household expenditure on strategic food were carried out using the LA-AIDS model using SUR analysis through the STATA software. Table 1 shows the estimated share regression coefficient of animal food expenditure for Indonesian aggregate households. From a total of 165 regression coefficients, 151 coefficients (91.51%) are significant at the 99% confidence level.

Table 1. Parameter estimation results for strategic food demand function

Independent variable	Dependent variable										
	Share of Rice	Share of Corn	Share of Soybean	Share of Shallot	Share of Chilli	Share of Poultry	Share of Eggs	Share of Beef	Share of Sugar	Share of Cooking Oil	Share of Fish
Alpha(Constant)	0,3796	-0,0116	-0,0010	-0,0705	0,1134	0,3035	-0,0416	0,1610	-0,4124	-0,2610	0,8406
	(0,0000)	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**
Expenditure beta	0,0272	0,0007	0,0000	-0,0215	0,0089	0,0335	-0,0280	0,0115	-0,0659	-0,0395	0,0731
	(0,0000)	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**
Rice price	0,0002	-0,0005	0,0001	0,0060	0,0130	0,0088	0,0088	0,0088	-0,0011	-0,0108	-0,0333
	(0,9170)	**(0,0080)**	**(0,0010)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0200)**	**(0,0000)**	**(0,0000)**
Corn price	-0,0005	-0,0100	0,0001	-0,0001	0,0013	-0,0005	0,0011	0,0070	-0,0011	0,0025	0,0003
	(0,0080)	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**
Soybean price	0,0001	0,0001	-0,0017	0,0000	0,0000	0,0001	0,0000	0,0013	0,0000	0,0001	0,0000
	(0,0010)	**(0,0000)**	**(0,0000)**	**(0,0140)**	**(0,5970)**	**(0,0000)**	**(0,4510)**	**(0,0000)**	**(0,0560)**	**(0,0200)**	**(0,0000)**
Shallot price	0,0060	-0,0001	0,0000	0,0116	-0,0037	-0,0048	0,0040	-0,0012	0,0073	0,0006	-0,0197
	(0,0000)	**(0,0000)**	**(0,0140)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0050)**	**(0,0000)**
Chilli price	0,0130	0,0013	0,0000	-0,0037	0,0045	0,0010	-0,0089	0,0049	-0,0025	-0,0141	0,0045
	(0,0000)	**(0,0000)**	**(0,5970)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**
Poultry price	0,0088	-0,0005	0,0001	-0,0048	0,0010	0,0260	-0,0147	0,0030	-0,0147	-0,0259	0,0216
	(0,0000)	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**
Eggs price	0,0088	0,0011	0,0000	0,0040	-0,0089	-0,0147	0,0216	-0,0029	0,0125	-0,0008	-0,0207

	(0,0000)	**(0,0000)**	**(0,4510)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0370)**	**(0,0000)**
Beef price	0,0088	0,0070	0,0013	-0,0012	0,0049	0,0030	-0,0029	-0,0237	-0,0055	-0,0035	0,0118
	(0,0000)	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**
Sugar price	-0,0011	-0,0011	0,0000	0,0073	-0,0025	-0,0147	0,0125	-0,0055	0,0277	0,0178	-0,0404
	(0,0200)	**(0,0000)**	**(0,0560)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**
Cooking Oilt price	-0,0108	0,0025	0,0001	0,0006	-0,0141	-0,0259	-0,0008	-0,0035	0,0178	0,0666	-0,0323
	(0,0000)	**(0,0000)**	**(0,0200)**	**(0,0050)**	**(0,0000)**	**(0,0000)**	**(0,0370)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**
Fish Price	-0,0333	0,0003	0,0000	-0,0197	0,0045	0,0216	-0,0207	0,0118	-0,0404	-0,0323	0,1083
	(0,0000)	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**
Eta (total of household members)	-0,0023	0,0000	0,0000	0,0004	0,0003	0,0000	0,0003	0,0001	0,0002	0,0003	0,0007
	(0,0000)	**(0,9300)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0870)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**
Eta (village/city)	-0,0022	0,0000	0,0000	-0,0013	0,0009	0,0043	0,0027	0,0012	-0,0024	-0,0020	-0,0014
	(0,0000)	**(0,3900)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**	**(0,0000)**

Source: March 2023 Susenas.

Table 1 shows that the increase in prices for corn, soybean, and beef reduces the share of expenditure on related commodities. Meanwhile, the increase in prices of rice, shallot, chilli, poultry, eggs, sugar, cooking oil, and fish actually resulted in an increase in consumption of related foods. The share of household expenditure on strategic food depends on the volume of food consumed and food prices. The results of the analysis show that the coefficient of price parameters related to corn, soybean, and beef commodities is negative, which means that an increase in the price of corn, soybean, and beef reduces the share of demand for corn, soybean, and beef. This is in accordance with the Dawnward Slopping demand curve theory, and supports the research results (Shibia, A. G., & Barako, D. G. , 2017); (Zhou, D., Yu, X., Abler, D., & Chen, D. , 2020).

The research results show that increasing total of household members will increase the share of household expenditure on corn, soybean, shallot, chilli, poultry, eggs, beef, sugar, cooking oil, and fish. And conversely, an increase in total of household members will reduce the share of household expenditure on rice. Ini sebuah temuan yang menarik dan tidak umum. Kondisi ini disebabkan rumahtangga perkotaan memiliki pendapatan rumahtangga yang lebih tinggi dibanding rumahtangga perdesaan. Sejalan dengan temuan (Sunaryati, R. , 2021) yang menyatakan bahwa semakin tinggi tingkat pendapatan rumahtangga akan menurunkan konsumsi pangan rumahtangga tersebut. Other findings show that expenditure of household members will increase the share of household expenditure on strategic foods except shallot, eggs, sugar, and cooking oil.

The Effect of Price Changes and Expenditure of Strategic Food on Indonesian Household Demand

Marshallian price elasticity of demand (or often simply referred to as price elasticity of demand) is a measure that describes the responsiveness of the quantity demanded of a good to changes in the price of that good. More formally, price elasticity of demand measures the percentage change in quantity demanded resulting from a percentage change in price. Meanwhile, Hicksian elasticity of demand, also known as compensation elasticity or compensatory price elasticity, measures the responsiveness of quantity demanded to changes in price, assuming that consumer utility (satisfaction) is fixed or constant. This differs from

Marshallian elasticity of demand, which does not assume utility remains constant. The results of the Marshalian and Hicksian price elasticity analysis are presented in Table 2.

Table 2. Price Elasticity and Cross Price Elasticity of Indonesian Urban Households

Commodity	Rice	Corn	Soybean	Shallot	Chilli	Poultry	Eggs	Beef	Sugar	Cooking Oil	Fish
Marshallian Elasticity (*Uncompensanted*)											
Rice	**-1,0270**	-0,0022	0,0003	0,0237	0,0328	0,0078	0,0342	0,0218	0,0221	-0,0220	-0,1513
Corn	-0,1601	**-2,9130**	0,0125	-0,0105	0,2304	-0,1464	0,2284	1,3271	-0,1542	0,5041	-0,0542
Soybean	0,4698	0,4582	**-12,6710**	-0,1793	-0,0018	0,8341	-0,0977	9,3226	0,0041	0,4495	0,0560
Shallot	0,2246	0,0015	-0,0003	**-0,8507**	-0,0148	0,0276	0,0274	0,0126	-0,0178	-0,0514	-0,0634
Chilli	0,1335	0,0191	0,0001	-0,0466	**-0,9499**	-0,0372	-0,1249	0,0614	0,0287	-0,1922	-0,0524
Poultry	-0,0713	-0,0096	0,0013	-0,0240	-0,0385	**-0,8365**	-0,1234	-0,0035	-0,0047	-0,2096	-0,0470
Eggs	0,2355	0,0155	-0,0001	0,0206	-0,0581	-0,0639	**-0,7918**	-0,0022	0,0116	-0,0695	0,0019
Beef	0,23434	0,48088	0,0926	-0,0160	0,2266	-0,0653	-0,1160	**-2,7431**	-0,0273	-0,0776	0,1769
Sugar	0,61830	-0,0093	0,0003	0,0479	0,1363	0,1515	0,12219	0,02332	**-1,00160**	0,097073	0,2158
Cooking Oilt	0,08779	0,0371	0,0009	-0,03110	-0,11353	-0,1667	-0,06211	0,00452	0,01657	- **0,246881**	-0,0314
Fish	-0,29864	-0,0023	0,00004	-0,0610	-0,0252	-0,0158	-0,0561	0,0183	-0,0362	-0,0748	**-0,7809**
Hicksian Elasticity (C*ompensanted*)											
Rice	**-0,6908**	0,0033	0,0004	0,0954	0,0992	0,1043	0,1297	0,0369	0,0714	0,0606	0,0897
Corn	0,20008	**-2,90706**	0,012673	0,06661	0,30152	-0,0430	0,3307	1,3434	-0,1014	0,5926	0,2040
Soybean	0,9000	0,4653	**-12,6708**	-0,0877	0,0832	0,9574	0,0244	9,3420	0,0672	0,5552	0,3642
Shallot	0,4481	0,0051	-0,0002	**-0,8031**	0,0294	0,0917	0,0909	0,0227	0,0150	0,0036	0,0968
Chilli	0,5016	0,0251	0,0002	0,0319	**-0,8772**	0,0684	-0,0204	0,07801	0,0826	-0,1017	0,2115
Poultry	0,3622	-0,0025	0,0015	0,0684	0,0471	**-0,7121**	-0,0003	0,0160	0,0588	-0,1030	0,2637
Eggs	0,4576	0,0192	0,00004	0,0679	-0,0142	-0,0002	**-0,7287**	0,0078	0,0442	-0,0148	0,1612
Beef	0,8160	0,4905	0,0929	0,1080	0,3416	0,1016	0,0492	**-2,7169**	0,0581	0,0654	0,5938
Sugar	0,4909	-0,0114	0,0002	0,0208	0,11108	0,11493	0,0860	0,0176	**-1,0203**	0,0658	0,1245
Cooking Oilt	0,24789	0,03970	0,001013	0,00302	-0,08191	-0,12074	-0,01665	0,01175	0,04004	**-0,207521**	0,08340
Fish	0,12400	0,00469	0,000228	0,02912	0,05829	0,10546	0,06389	0,03739	0,02579	0,029125	**-0,47798**

Source: March 2022 Susenas

Price elasticity values, both Marshalian and Hicksian, are all negative. This finding is in accordance with the law of demand which states that if the price of a commodity increases, the demand for that commodity decreases. Rice, corn, soybean, beef, and sugar are Marshalian elastic. Meanwhile, corn, soybean, beef, and sugar are Hicksian elastic. Rice in urban households is elastic to price changes is an unusual finding. This finding needs to be studied more deeply. There is a suspicion that in urban areas the increase in rice makes households switch to consuming other carbohydrates, such as bread, potatoes or others..

Shallot, chilli, poultry, eggs, cooking oil, and fish normal goods because they are inelastic in both Marshalian and Hicksian terms. The price increase for these six commodities was higher than the increase in demand. These six commodities are not very responsive to price increases. Beef is the most elastic commodity in both Marshalian and Hicksian terms. The price elasticity value for mutton is 2,743 on a Marshalian basis and 2,716 on a Hicksian basis. This condition shows that beef are superior goods for Indonesian urban households.

Marshalian cross price elasticity shows that eggs is a substitute for poultry and beef. This means that if the price of eggs rises, households will switch to consuming poultry and beef. Cooking oil is a commodity that complements each other with rice, corn, soybean, beef, and sugar. Sesuai dengan temuan (Supritiswendi, S., Rahman, A., & Simanullang, E. S.) Corn is substituted with rice. Fish is substituted with poultry and eggs. This finding supports the research results (Nursamsi, N., Nurmalina, R., & Rifin, A, 2019).

The findings of the Hicksian elasticity analysis show that rice and fish will be consumed together with all other commodities (rice, soybean, shallot, chilli, poultry, eggs, beef, sugar, and cooking oil). Fish, beef, and chilli are commodities that are complementer for cooking oil based on the results of Hicksian cross analysis.

In economic analysis, expenditure elasticity and marginal elasticity are two concepts used to measure the sensitivity of consumer expenditure to changes in prices and income. Expenditure elasticity measures the responsiveness of total spending on a good to changes in the price of that good. This can help understand how price changes affect overall consumer spending on the good. Marginal elasticity measures the marginal change in demand for a good in response to changes in total expenditure or income. This is important in economic analysis to understand how additional spending or income affects the demand for certain goods. The results of the analysis of expenditure elasticity are presented in Table 3.

Table 3. Income Elasticity and Marginal Expenditure Share

Commodity	Income elasticity
Rice	1,0599
Corn	1,1356
Soybean	1,1355
Shallot	0,0704
Chllies	1,1607
Poultry Meat	1.1369
Eggs	0.7005
Beef	1.8338
Sugar	-0.4017
Cooking Oil	0.5048
Fish	1.3324

Source: March 2023 Susenas.

Table 3 shows that all strategic food commodities have positive expenditure elasticity except for consumption sugar. This finding explains that rice, corn, soybean, shallot, chilies, poultry meat, beef, eggs, cooking oil and fish are normal goods. An interesting finding is that the elasticity value of sugar is negative, which means that sugar is an inferior commodity for urban households. Urban households tend to shift to healthier food patterns along with increasing health awareness. The income of urban households is relatively higher than that of rural households, making it possible for urban households to buy healthier alternative products than consumption sugar.

4. CONCLUSION

Price elasticity values, both Marshalian and Hicksian, are all negative. Rice in urban households is elastic to price changes is an unusual finding. This finding needs to be studied more deeply. There is a suspicion that in urban areas the increase in rice makes households switch to consuming other carbohydrates, such as bread, potatoes or others. The elasticity value of sugar is negative, which means that sugar is an inferior commodity for urban households. Urban households tend to shift to healthier food patterns along with increasing health awareness. The income of urban households is relatively higher than that of rural households, making it possible for urban households to buy healthier alternative products than consumption sugar

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