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SOCIAL AND ECONOMIC DETERMINANTS OF IMPORTED SOBEAN DEMAND AMONG TEMPE PRODUCERS IN KURIPAN KERTOHARJO, SOUTH PEKALONGAN, PEKALONGAN CITY

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ABSTRACT

Soybeans represent an essential agricultural commodity with persistently strong demand in Indonesia. Nevertheless, domestic soybean output has remained insufficient to fulfill national consumption needs, leading to a high dependence on imported supplies. Kuripan Kertoharjo Subdistrict is popularly known as "Tempe Village" because a considerable share of its residents are engaged in tempe production, where imported soybeans constitute the principal input. This study seeks to (1) characterize tempe producers operating in Kuripan Kertoharjo Subdistrict, (2) assess the influence of social and economic variables on the demand for imported soybeans, and (3) evaluate the elasticity of imported soybean demand among tempe producers. The research was conducted in Kuripan Kertoharjo Subdistrict, South Pekalongan District, Pekalongan City, during the period from April 21 to May 20, 2025. A survey method was employed, applying probability sampling through a simple random sampling technique, which resulted in a total of 43 respondents. Analytical methods included descriptive analysis, multiple linear regression, and demand elasticity estimation. The findings reveal that the majority of tempe producers are male, within the productive age group, and predominantly have junior high school educational backgrounds. Most respondents possess 21–39 years of business experience, utilize 751–1,449 kg of soybeans per month, and purchase soybeans between 21 and 30 times monthly. The average net monthly income is IDR 6,234,367. Regression results indicate that imported soybean prices and net income significantly affect imported soybean demand, whereas local soybean prices, purchasing frequency, soybean quality, business experience, and producer age do not. Furthermore, demand for imported soybeans is price-elastic, and cross-elasticity results suggest that local soybeans function as complementary goods.

***Keywords**: demand, imported soybeans, tempe producers*

Introduction

Agriculture is a major sector in Indonesia that plays an important and strategic role in economic growth (Anjani et al., 2015). The development of the agricultural sector largely derives from food crops (Rahmawati, 2022). One of the most widely cultivated and consumed food crops in Indonesia is soybean. Soybean (Glycine max L.) is a food crop commodity that is extensively consumed by Indonesian society because it is an important source of protein for humans. National soybean consumption is predominantly processed into tempe, as the average per capita consumption of tempe in Indonesia reaches 7 kg per year (Asbur & Khairunnisyah, 2021).

Ramayanti et al. (2023) highlight the contribution of the Indonesian tempe industry to labor absorption and its role in sustaining food security. However, Indonesia's current food security faces a major challenge related to the inability of the agricultural sector to meet the rapidly increasing demand for food. Soybean is an

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agricultural commodity with high demand, while domestic soybean production has not yet been able to satisfy this demand, causing Indonesia to rely on soybean imports. Continuous soybean imports from other countries may threaten food self-sufficiency and weaken a country's economic position due to dependence on exporting countries (Silitonga, 2024). Sukirno (2016) defines demand as the amount of goods or services that consumers are willing to purchase at a particular price during a specific time frame. Furthermore, Titu et al. (2023) explain that demand is determined by various factors, such as the price of the product, prices of related goods, consumer income, household dependents, and individual tastes. National soybean demand reaches approximately 2.6 million tons per year (Ministry of Agriculture, 2021).

Pekalongan City is one of the cities in Central Java with areas known for tempe production. The subdistrict with the largest number of tempe producers in Pekalongan City is South Pekalongan District, particularly Kuripan Kertoharjo Subdistrict. Kuripan Kertoharjo Subdistrict, South Pekalongan District, Pekalongan City, is known as "Tempe Village" because many residents work as small and medium-scale tempe producers. The daily soybean requirement for tempe production in Kuripan Kertoharjo Subdistrict reaches approximately 4 tons. Insufficient domestic soybean production has forced tempe producers to rely on imported soybeans. Decisions to use imported soybeans are influenced not only by economic factors but also by social factors, which pose a serious threat by encouraging continued soybean imports. Accordingly, this research seeks to examine the characteristics of tempe producers in Kuripan Kertoharjo Subdistrict, evaluate the effects of socioeconomic factors on imported soybean demand, and estimate the demand elasticity of imported soybeans among local tempe producers.

Research Method

The research was conducted in Kuripan Kertoharjo Subdistrict, South Pekalongan District, Pekalongan City, from April 21 to May 20, 2024. The research location was selected purposively. The object of this study was the demand for imported soybeans among tempe producers in Kuripan Kertoharjo Subdistrict who purchased imported soybeans for the production process during a one-month period.

This study applied a probability-based sampling approach using a simple random sampling technique. From a population of 86 tempe producers in Kuripan Kertoharjo Subdistrict, a total of 43 respondents were selected as the research sample. The data analysis methods used were descriptive analysis, multiple linear

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regression analysis, and demand elasticity analysis. The observed variables and their measurement units are as follows:

1. Demand for imported soybeans (Y) is the quantity of soybeans purchased from abroad to meet monthly tempe production needs, measured in kilograms per month (kg/month).
2. Price of imported soybeans (X_1) is the average monthly price of soybeans purchased from abroad that must be paid by tempe producers, measured in Indonesian rupiah per kilogram (IDR/kg).
3. Price of local soybeans (X_2) is the average monthly price of domestically produced soybeans paid by tempe producers, measured in Indonesian rupiah per kilogram (IDR/kg).
4. Net income (X_3) is the net business profit of tempe producers over a one-month period, measured in Indonesian rupiah per month (IDR/month).
5. Frequency of purchasing imported soybeans (X_4) refers to how often imported soybeans are purchased within a one-month period, measured in times per month (times/month).
6. Quality of imported soybeans (X_5) refers to the quality or degree of suitability of soybeans used by tempe producers in the production process, expressed as a score (1–3) using ordinal or scoring data.

A study conducted by Yudiano and Cahyono (2019), entitled "Socioeconomic Factors and Perceptions of Tempe Producers in the Use of Soybean Raw Materials (A Case Study in the Sanan Tempe Industrial Center)", indicates that imported and local soybeans differ in quality based on several criteria, including size, taste, expansion capacity, availability, cleanliness, and color. Imported soybeans are characterized by larger bean size, more affordable prices, better cleanliness and uniformity, yellow color, and easier availability. Based on Yudiano and Cahyono (2019), soybean quality is assessed using several criteria, which are presented in

Table 1. Criteria for Evaluating Soybean Quality

No	Soybean Criteria	Score		
		1	2	3
1	Texture	Wrinkled, uneven, and not compact skin	Slightly wrinkled and uneven skin, compact	Smooth, non-wrinkled, and compact skin
2	Shape	Flat	Oval	Round
3	Size	Small and uniform	Variable	Large and uniform
4	Color	White	Whitish yellow	Yellow

Additional observed variables are defined as follows:

1. Business experience (X_6) refers to the length of time tempe producers have operated their business, measured in years.
2. Age of producers (X_7) refers to the age of tempe producers, measured in years. According to Statistics Indonesia (BPS, 2020), the productive age range of the Indonesian population is 15–64 years.

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Results and Discussion

Characteristics of Tempe Producers

1. Characteristics of Tempe Producers by Gender

   The characteristics of tempe producers based on gender can be classified into two groups: male and female respondents. The total number of respondents in this study was 43. Respondent characteristics according to gender are summarized in Table 2.

   Table 2. Gender Distribution of Tempe Producers in Kuripan Kertoharjo Subdistrict, 2025

Gender	Number of Respondents (Persons)	Percentage (%)
Male	39	90,7
Female	4	9,3
Total	43	100

   Source: Processed primary data, 2025

   As presented in Table 2, male tempe producers account for 39 respondents (90.7%), whereas female producers number only 4 respondents (9.3%). These figures demonstrate that tempe production in Kuripan Kertoharjo Subdistrict is predominantly undertaken by men. This pattern reflects the prevailing role of men as household heads who are primarily responsible for earning family income. The result aligns with Londo et al. (2017), who argue that men typically occupy a central position in household economic responsibilities, while women are more likely to concentrate on domestic tasks and assist their spouses in business-related activities.

2. Characteristics of Tempe Producers by Age

   Based on the classification issued by Statistics Indonesia (BPS, 2020), the ages of tempe producers are categorized into pre-productive (<15 years), productive (15–65 years), and non-productive (>65 years) age groups. The characteristics of tempe producers by age are presented in Table 3.

   Table 3. Characteristics of Tempe Producers by Age in Kuripan Kertoharjo Subdistrict, 2025

Category	Age (Years)	Number of Respondents (Persons)	Percentage (%)
Pre-productive	< 15	0	0,0
Productive	15 - 65	42	97,7
Non-productive	> 65	1	2,3
Total		43	100

   Source: Processed primary data, 2025

   As presented in Table 3, 42 respondents (97.7%) fall within the productive age category, while only 1 respondent (2.3%) is classified as non-productive. This indicates that tempe producers in Kuripan Kertoharjo Subdistrict are predominantly of productive age, suggesting a high level of labor productivity in operating their businesses. The result aligns with Jamaludin et al. (2024), who explain that workers

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within the productive age range tend to have higher productivity because their physical capacity and work performance are still optimally functioning.

3. Characteristics of Tempe Producers by Formal Education Level

The characteristics of tempe producers based on formal education level are classified into five categories: not completing elementary school, elementary school, junior high school, senior high school, and higher education (Diploma/Bachelor's/Master's/Doctoral degrees), as presented in Table 4.

Table 4. Characteristics of Tempe Producers by Formal Education Level in Kuripan Kertoharjo, 2025

Education Level	Number of Respondents (Persons)	Percentage (%)
Did not complete elementary school	0	0,0
Elementary school	11	25,6
Junior high school/equivalent	19	44,2
Senior high school/equivalent	13	30,2
Higher education (Diploma/Bachelor's/Master's/Doctoral)	0	0,0
Total	43	100

Source: Processed primary data, 2025

Table 4 indicates that 11 tempe producers (25.6%) have an elementary school education, 19 producers (44.2%) have a junior high school education, and 13 producers (30.2%) have a senior high school education. None of the respondents attained higher education. According to Fitrianto et al. (2021), education level is one of the main determinants influencing an individual's ability to absorb and apply increasingly modern innovations and technologies. Higher education levels generally enhance individuals' awareness of their needs, which subsequently influences their decision-making behavior, including choices related to purchasing.

4. Characteristics of Tempe Producers by Business Experience

The characteristics of tempe producers based on business experience are classified into three categories: ≤20 years, 21–39 years, and ≥40 years, as presented in Table 5.

Table 5. Characteristics of Tempe Producers by Business Experience in Kuripan Kertoharjo, 2025

Business Experience (Years)	Number of Respondents (Persons)	Percentage (%)
≤ 20	13	30,2
21 - 39	24	55,8
≥ 40	6	14
Total	43	100

Source: Processed primary data, 2025

Table 5 shows that 13 tempe producers (30.2%) have business experience of ≤20 years, 24 producers (55.8%) have 21–39 years of experience, and 6 producers (14.0%) have ≥40 years of experience. These

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findings indicate that tempe producers in Kuripan Kertoharjo Subdistrict generally possess long business experience. According to Jamaludin et al. (2024), longer business experience or tenure enhances workers' skills and perseverance, which in turn increases productivity. Consistent with this view, tempe producers in Kuripan Kertoharjo Subdistrict are predominantly those with 21–39 years of business experience.

5. Characteristics of Tempe Producers by Soybean Usage

The characteristics of tempe producers based on soybean usage are classified into three levels from the lowest to the highest, namely soybean usage of ≤750 kg/month, 751–1,449 kg/month, and ≥1,500 kg/month, as presented in Table 6.

Table 6. Characteristics of Tempe Producers by Soybean Usage in Kuripan Kertoharjo Subdistrict, 2025

Soybean Usage (kg/month)	Number of Respondents (Persons)	Percentage (%)
≤ 750	6	14
751 – 1.449	22	51,2
≥ 1.500	15	34,9
Total	43	100

Source: Processed primary data, 2025

As presented in Table 6, most tempe producers fall within the medium soybean usage category, comprising 22 respondents (51.2%), followed by 15 respondents (34.9%) classified as high users and 6 respondents (14.0%) as low users. These findings suggest that tempe production in Kuripan Kertoharjo Subdistrict is largely dominated by medium-scale enterprises. The quantity of soybeans utilized by producers is determined by their available capital and responds to prevailing market demand. This result supports the findings of Rahmawati et al. (2023), who note that soybean consumption among producers is influenced by capital capacity, production requirements, and consumer demand levels.

6. Characteristics of Tempe Producers by Frequency of Soybean Purchases

The monthly soybean purchasing frequency of tempe producers is categorized into three groups—1–10, 11–20, and 21–30 times per month—as shown in Table 7.

Table 7. Characteristics of Tempe Producers by Frequency of Soybean Purchases in Kuripan Kertoharjo, 2025

Purchase Frequency (times/month)	Number of Respondents (Persons)	Percentage (%)
1 - 10	6	14
11 - 20	1	2,3
21 - 30	36	83,7
Total	43	100

Source: Processed primary data, 2025

Table 7 indicates that 6 tempe producers (14.0%) purchase soybeans infrequently (1–10 times per month), 1 producer (2.3%) purchases soybeans at a moderate frequency (11–20 times per month), and the

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majority, 36 producers (83.7%), purchase soybeans frequently, namely 21–30 times per month. This demonstrates that soybean purchasing among tempe producers is dominated by a high purchase frequency. According to Rahmawati et al. (2023), income levels and consumer satisfaction are among the factors influencing purchase frequency. Most tempe producers procure soybeans from nearby local shops within the Kuripan Kertoharjo area due to their close proximity.

7. Characteristics of Tempe Producers by Income

Cost and income analysis was calculated based on the average income during one month of production. The average net business income of tempe producers in Kuripan Kertoharjo Subdistrict for the production period of April 21 to May 20, 2025, is presented in Table 8.

Table 8. Characteristics of Tempe Producers by Income in Kuripan Kertoharjo Subdistrict, 2025

No	Description	Value (IDR)			
1	Fixed Costs (IDR/month)				
	a. Equipment depreciation cost	67.280			
	b. Land and building tax	6.620	+		
	Subtotal ..... (1)			73.900	
2	Variable Costs (IDR/month)				
	a. Soybean raw material cost	12.024349			
	b. Starter (yeast) cost	80.802			
	c. Packaging cost				
	1) Plastic packaging	295.814			
	2) Leaf packaging	66.279			
	Total packaging cost ..... (c)	362.093			
	d. Marketing cost	374.419			
	e. Fuel cost	619.884			
	f. Labor cost	3.111.977			
	g. Electricity and water cost	149.419			
	h. Market retribution fee	159.767			
	i. Stationery cost	4.883			
	j. Drinking water cost	89.023	+		
	Subtotal ..... (2)			16.976.616	
	Total production cost (1+2)			17.050.516	
3.	Production (Pcs)	4.719			
4.	Price per unit (IDR/pcs)	4.934			
5.	Revenue (IDR)			23.284.884	
6.	Net business income (IDR)			6.234.367	

Source: Processed primary data, 2025

Table 8 shows that the average monthly net income of tempe producers is IDR 6,234,367, with an average production of 4,719 pieces of tempe and an average total production cost of IDR 17,050,516, consisting of

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average fixed costs of IDR 73,900 and average variable costs of IDR 16,976,616. According to Lestari and Widodo (2021), the sustainability of a business depends on its ability to finance all operational needs using the income generated. The City/Regency Minimum Wage (UMK) of Pekalongan City in 2025 is IDR 2,545,138 (Pekalongan City Government, 2024). The positive average income of IDR 6,234,367 indicates that tempe production in Kuripan Kertoharjo Subdistrict is profitable and economically feasible to operate and sustain, as it exceeds the minimum wage established in Pekalongan City.

Faktor-Faktor yang Memengaruhi Permintaan Kedelai Impor

1. Classical Assumption Test

a. Normality Test

Table 9. Normality Test Results Based on the One-Sample Kolmogorov–Smirnov Method

One-Sample Kolmogorov-Smirnov Test	
Test Statistic	0,112
Asymp. Sig. (2-tailed)	0,200[c]

Source: Processed primary data, 2025

Based on Table 9, the One-Sample Kolmogorov–Smirnov test produces a significance value of 0.200, which exceeds the 0.05 threshold. This result indicates that the data included in the regression analysis follow a normal distribution. This conclusion aligns with Ghozali (2021), who explains that a significance value greater than 0.05 in the Kolmogorov–Smirnov test suggests that the assumption of normality is satisfied.

b. Multicollinearity Test

Table 10. Results of the Multicollinearity Test

Variable	*Tolerance*	VIF
Price of Imported Soybeans (X_1)	0,867	1,153
Price of Local Soybeans (X_2)	0,923	1,083
Net Income (X_3)	0,957	1,044
Frequency of Imported Soybean Purchases (X_4)	0,959	1,042
Soybean Quality (X_5)	0,839	1,192
Business Experience (X_6)	0,460	2,176
Age of Producers (X_7)	0,513	1,950

Source: Processed primary data, 2025

Referring to the multicollinearity test results in Table 10, all independent variables exhibit tolerance values above the critical threshold of 0.10, namely X1 = 0.867, X2 = 0.923, X3 = 0.957, X4 = 0.959, X5 = 0.839, X6 = 0.460, and X7 = 0.513. Likewise, the corresponding VIF values are relatively low, ranging from 1.042 to 2.176, with X1 = 1.153, X2 = 1.083, X3 = 1.044, X4 = 1.042, X5 = 1.192, X6 = 2.176, and X7 = 1.950. Since all tolerance values exceed 0.10 and all VIF values are well below 10, the regression model can be considered free from multicollinearity issues. This result aligns with the

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criteria proposed by Ghozali (2021), which indicate that multicollinearity is not present when tolerance values are greater than 0.10 and VIF values are less than 10.

c. Heteroscedasticity Test

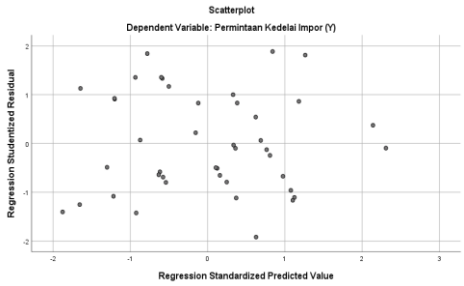

Figure 1. Heteroscedasticity Test (Scatterplot)
Source: Processed SPSS output, 2025

Based on the scatterplot displayed in Figure 1, there is no indication of heteroscedasticity in the research data. This conclusion is supported by the random dispersion of data points, which do not exhibit a discernible or systematic pattern. Such a distribution suggests that the variance of the residuals is constant across observations. This result is in line with the explanation provided by Ghozali (2021), who notes that a regression model can be considered free from heteroscedasticity when the scatterplot shows residuals that are randomly spread above and below the zero line on the Y-axis without forming a specific pattern.

2. Hypothesis Test

Table 11. Results of Multiple Linear Regression Analysis

Variable	Regression Coefficient	Significance
Constant (C)	-1.099,009	0,684^{ns}
Price of Imported Soybeans (X1)	0,339	0,000*
Price of Local Soybeans (X2)	-0,202	0,504^{ns}
Net Income (X3)	0,000136	0,000*
Frequency of Imported Soybean Purchases (X4)	-4,382	0,125^{ns}
Quality of Imported Soybeans (X5)	-12,237	0,640^{ns}
Business Experience (X6)	0,622	0,857^{ns}
Age of Producers (X7)	2,496	0,516^{ns}
R-square	0,875	
Adjusted R-square	0,850	
F-statistic	34,964	
Prob (F-statistic)	0,000	
Notes:		
^{ns} : not significant		

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*) : significant at the 95% confidence level (α = 0.05)
**) : significant at the 99% confidence level (α = 0.01)

Source: Processed primary data, 2025

Based on the regression results presented in Table 11, the estimated multiple linear regression equation is as follows:

Y = -1.099,009 + 0,339X1 – 0,202X2 + 0,000136X3 – 4,382X4 – 12,237X5 + 0,622X6 + 2,496X7 + e

where:
Y = demand for imported soybeans (kg/month)
a = constant
b_1–b_7 = regression coefficients
X_1 = price of imported soybeans (IDR/kg)
X_2 = price of local soybeans (IDR/kg)
X_3 = net income (IDR/month)
X_4 = frequency of imported soybean purchases (times/month)
X_5 = quality of imported soybeans (score 1–3)
X_6 = business experience (years)
X_7 = age of producers (years)
e = error term

Table 11 indicates that the adjusted R-square value is 0.850, meaning that 85% of the variation in the demand for imported soybeans (Y) can be explained by the independent variables, namely the price of imported soybeans (X1), price of local soybeans (X2), net income (X3), frequency of imported soybean purchases (X4), soybean quality (X5), business experience (X6), and producers' age (X7). The remaining 15% of the variation is attributed to other factors not captured in the model.

The F-test results show a significance level of 0.000, which is lower than the 0.05 threshold. This indicates that all independent variables collectively exert a statistically significant influence on the demand for imported soybeans among tempe producers in Kuripan Kertoharjo Subdistrict, South Pekalongan District, Pekalongan City. This result supports the criterion proposed by Ghozali (2021), which states that when the significance value is below 0.05, the null hypothesis is rejected and the alternative hypothesis is accepted, implying a joint effect of the independent variables on the dependent variable.

Furthermore, the individual contribution of each independent variable was assessed through partial testing using the t-test.The results indicate that the price of imported soybeans (X1) and net income (X3) have a significant effect on the demand for imported soybeans among tempe producers in Kuripan Kertoharjo Subdistrict. In contrast, the price of local soybeans (X2), frequency of imported soybean purchases (X4), soybean quality (X5), business experience (X6), and age of producers (X7) do not have a significant effect on the demand for imported soybeans in the study area.

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Price of Imported Soybeans (X_1)

The price of imported soybeans (X_1) shows a significance level of 0.000, which is below the 0.05 threshold, indicating a statistically significant effect on the demand for imported soybeans among tempe producers in Kuripan Kertoharjo Subdistrict. This result aligns with the fundamental principle of demand, which explains an inverse relationship between price and quantity demanded: increases in price tend to reduce demand, while price decreases encourage higher consumption (Mursyid & Lamtana, 2020). Moreover, this finding is consistent with the study by Siadari (2025), which concludes that commodity prices play a decisive role in influencing demand levels.

Price of Local Soybeans (X_2)

The local soybean price variable (X_2) yields a significance level of 0.504, exceeding the 0.05 criterion, which indicates that it does not exert a statistically significant influence on the demand for imported soybeans among tempe producers in Kuripan Kertoharjo Subdistrict. This result suggests that tempe producers remain strongly reliant on imported soybeans, as domestic soybean output is unable to adequately supply their production requirements. Grace et al. (2021) similarly emphasize that the expansion of the food processing industry has driven soybean demand beyond the capacity of local production. Observations in the field further reveal that local soybeans are rarely utilized as production inputs by tempe producers; consequently, changes in local soybean prices do not affect their purchasing decisions regarding imported soybeans. This outcome is consistent with the findings of Habib and Risnawati (2018), who demonstrate that price fluctuations of substitute goods do not necessarily have a significant impact on the demand for the primary commodity.

Net Income (X_3)

The net income variable (X_3) shows a significance value of 0.000, which is below the 0.05 threshold, indicating that net income has a statistically significant influence on the demand for imported soybeans among tempe producers in Kuripan Kertoharjo Subdistrict. This result implies that higher income levels enable producers to increase input utilization to support larger production volumes. The finding aligns with Adelina et al. (2017), who explain that rising income motivates tempe producers to scale up their production activities in pursuit of greater profits and improved welfare. In addition, this result is in accordance with Huda et al. (2022), who note that industrial scale is closely associated with the amount of profit or net income generated.

Frequency of Imported Soybean Purchases (X_4)

The purchase frequency of imported soybeans (X_4) has a significance value of 0.125, which exceeds 0.05, indicating that it does not have a statistically significant effect on the demand for imported soybeans

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among tempe producers in Kuripan Kertoharjo Subdistrict. This finding is in line with Rahmawati et al. (2023), who reported that the frequency of purchasing imported soybeans does not significantly influence demand levels. Empirical observations show that producers tend to buy imported soybeans in relatively consistent quantities each time, so variations in purchase frequency do not alter the overall demand. This condition is consistent with Dewi et al. (2025), who explain that producers adjust purchasing frequency according to production requirements to preserve input quality while keeping costs efficient.

Quality of Imported Soybeans (X_5)

The quality of imported soybeans (X_5) has a significance value of 0.640 > 0.05, indicating that soybean quality does not have a significant effect on the demand for imported soybeans among tempe producers in Kuripan Kertoharjo Subdistrict. Field findings show that producers prioritize stable raw material availability and competitive prices to ensure business continuity; therefore, they prefer imported soybeans as production inputs despite variations in quality across purchases, as continuous production must be maintained. This finding is consistent with the study by Farhanah and Marzuqi (2021), which showed that product quality does not significantly influence purchasing decisions. It is further supported by Halimah and Nadja (2022), who argue that consumers prioritize product price over quality, although they still expect acceptable quality at affordable prices.

Business Experience (X_6)

The business experience variable (X6) shows a significance value of 0.857, which is greater than 0.05, indicating that business experience does not have a statistically significant effect on the demand for imported soybeans among tempe producers in Kuripan Kertoharjo Subdistrict. Producers with longer experience generally maintain relatively constant production levels because they have adopted more efficient production practices and optimized the use of raw materials. In addition, the level of soybean demand varies among producers depending on market dynamics and differences in marketing areas (Larasati, 2019). This result is in accordance with Rahmawati et al. (2023), who also reported that business experience does not significantly affect the demand for imported soybeans.

Age of Producers (X7)

The significance value of the producers' age variable (X7) is 0.516, which exceeds the 0.05 threshold, indicating that age does not have a statistically significant influence on the demand for imported soybeans among tempe producers in Kuripan Kertoharjo Subdistrict. Even as producers grow older, they are still able to maintain production activities by depending on hired labor, thereby offsetting possible declines in physical capability (Hendriana et al., 2020). This result is consistent with the findings of Trismawati (2018), who also reported that age does not significantly affect demand.

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3. Demand Elasticity

Based on the results of the study, the estimated demand elasticities are presented in Table 12

Table 12. Results of demand elasticity analysis

No	Variable	Regression Coefficient (b)	Mean Value	Elasticity
1	Demand for imported soybeans (Y)		1.225,81	
2	Price of imported soybeans (X1)	0.339	9.786,05	2,71
3	Price of local soybeans (X2)	-0.202	8627,91	-1,42

Source: Processed primary data, 2025

The elasticity figures presented in Table 8 were obtained by multiplying the estimated regression coefficient by the mean value of the independent variable and then dividing the result by the mean value of the dependent variable. This calculation method is consistent with Varian (2014), who explains that elasticity can be derived using the following formula:

$$\textbf{Elasticity} = b \times \frac{\textbf{X mean}}{\textbf{Y mean}}$$

Price Elasticity of Demand (Ep)

The price elasticity of demand for imported soybeans was calculated as follows:

$$Ep = b_1 \times \frac{\bar{x}1}{\hat{Y}}$$

$$= 0{,}339 \times \frac{9.786{,}05}{1.225{,}81}$$

$$= 2{,}71$$

The estimated price elasticity of demand for imported soybeans is 2.71 (> 1), indicating that the demand for imported soybeans is highly sensitive to price changes and therefore elastic. This indicates that a certain percentage increase in the price of imported soybeans will lead to a more than proportional percentage reduction in the quantity demanded, and conversely. This outcome supports the explanation by Mursyid and Lamtana (2020), who state that demand is considered inelastic when Ep < 1Ep <1, elastic when Ep >1 Ep >1, and perfectly elastic when Ep = ∞ Ep = ∞. Furthermore, the findings of this study are consistent with Larasati (2019), which concluded that the demand for imported soybeans exhibits a high degree of price elasticity.

Cross Elasticity of Demand (Ec)

The cross elasticity of demand for imported soybeans with respect to the price of local soybeans was calculated as follows:

$$Ep = b_2 \times \frac{\bar{x}2}{\hat{Y}}$$

$$= -0{,}202 \times \frac{8.627{,}91}{1.225{,}81}$$

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= -1,42

The cross-elasticity value of −1.42 indicates that a 1% increase in the price of local soybeans leads to a 1.42% decrease in the demand for imported soybeans. The negative sign of the cross elasticity suggests that local soybeans act as a complementary good rather than a substitute for imported soybeans. This finding is consistent with the study by Aidha (2019), which reported a negative cross elasticity between imported and local soybeans.

Field evidence further indicates that tempe producers primarily use imported soybeans as the main raw material due to the limited and uncertain availability of local soybeans. However, the possibility remains that local soybeans could be used as complementary inputs if their availability were sufficient to meet production needs. This observation is in line with Azzahra and Amaliah (2023), who reported that tofu and tempe producers prefer imported soybeans as their primary raw material because the supply of local soybeans is limited.

Conclusion

1. Characteristics of tempe producers in Kuripan Kertoharjo Village are predominantly male respondents (90.7%). Based on age, most respondents fall within the productive age category (97.7%), with the average highest level of formal education being junior high school. The business experience of tempe producers is relatively long, dominated by those with 21–39 years of experience (55.8%). Most producers use 751–1,449 kg of soybeans per month (51.2%), with an average purchase frequency of 26 times per month. The average monthly net income of respondents is IDR 6,234,367.
2. The factors of imported soybean price (X1), local soybean price (X2), net income (X3), frequency of imported soybean purchases (X4), soybean quality (X5), business experience (X6), and producers' age (X7) simultaneously affect the demand for imported soybeans (Y) among tempe producers in Kuripan Kertoharjo Village, South Pekalongan Subdistrict, Pekalongan City. Partially, the imported soybean price (X1) and net income (X3) have a significant effect on the demand for imported soybeans, whereas the local soybean price (X2), frequency of imported soybean purchases (X4), soybean quality (X5), business experience (X6), and producers' age (X7) do not have a significant partial effect on imported soybean demand.
3. The price elasticity of demand for imported soybeans is elastic, as its value is greater than one, while the cross-price elasticity of local soybean prices is negative.

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