

## Impact of corn self-sufficiency policies on corn demand in Indonesia's poultry sector



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### ABSTRACT

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Policies to increase corn production affect producers, consumers, and the livestock industry, particularly poultry. This study aims to analyze: (1) factors influencing corn production; (2) the effect of corn prices on corn supply; (3) the effect of corn supply on corn prices; and (4) the effect of corn input prices on input demand in the poultry industry. The study uses secondary panel data from 14 provinces in Indonesia during 2015–2024. Panel regression was applied to estimate supply, price, and demand functions while considering endogeneity in the simultaneous model. The results show that land area, seeds, fertilizers, pesticides, agricultural tools, and machinery significantly affect corn production. Corn prices have a positive and significant effect on corn supply, while corn supply has a negative and significant effect on corn prices. In addition, input prices negatively and significantly influence corn demand in the poultry industry. This finding indicates that the government needs to involve cooperatives in addition to logistics agencies in stabilizing corn prices during the main harvest. Furthermore, the government needs to implement coordinated policies from upstream to downstream sectors in the poultry industry through collaboration between agricultural services, livestock associations, and stakeholders.

**Contribution/ Originality:** This study contributes by simultaneously analyzing corn self-sufficiency policies and poultry industry development. Unlike previous studies that are mostly partial, it provides a more comprehensive understanding of the linkage between corn policies and poultry feed demand in Indonesia.

## 1. INTRODUCTION

In Indonesia, corn is designated by the government as a strategic national commodity due to reasons including: (1) corn farming is a source of income and employment for farming households; (2) corn is a food source, an input for the food industry, an input for the animal feed industry, and a commodity for export. The government has implemented a corn self-sufficiency policy to encourage an increase in national corn production through intensification and extensification. The effect of the above policy is the achievement of national corn self-sufficiency through high corn production growth. Domestic corn demand is primarily for animal feed, with the remainder for food consumption, other industrial needs, and seeds (Center for Agricultural Data and Information Systems, 2020; Prasetyo & Sari, 2024). The high use of corn in the feed industry is due to the high demand for poultry-based animal

protein sources. In 2021, the consumption participation rate for eggs in Indonesia reached 92.20%, and the consumption participation rate for poultry meat reached 60.22% (National Food Agency, 2022).

The poultry industry in Indonesia plays a significant role in the national economy, supplying around 65% of the demand for animal protein. This industry employs 10% of the total workforce (Ferlito & Respatiadi, 2018). Corn is the primary feed for the poultry industry; therefore, protectionist policies on corn will have both positive and negative impacts on food producers in several sectors, including the poultry industry. In the food crop sector, corn self-sufficiency policies will benefit producers due to increased production and high prices; however, these policies will harm livestock producers due to high corn feed costs. The above conditions have led to an increase in poultry commodity prices (Nik Sharifulden, 2023). Based on the above phenomenon, it is necessary to conduct a study on the effects of corn self-sufficiency policies on the poultry industry.

Previous researchers have conducted studies related to the effects of corn production policies, including: Ye, Qin, Li, Li, and Tong (2024) found that corn subsidy policies increase the productivity of household corn farming, so that the more subsidies given to corn farmers, the higher the productivity. In addition to subsidy policies, the government also implements price policies. Price policies have a positive and significant impact on the corn field area (Edison & Wahyuni, 2020). Several other researchers such as (Ratri, Rahayu, & Antriandarti, 2019) and Goyal, Adjemian, and Secor (2022), found that price is one of the determinants of corn supply. The results of studies by Onuche (2021), Guo, Shen, Li, and Ai (2023), and Shen and Qiu (2024) indicate that corn prices are influenced by various factors, including corn demand, corn supply, imported corn prices, and others. Furthermore, Erenstein, Jaleta, Sonder, Mottaleb, and Prasanna (2022) also conducted research from the perspective of corn production, consumption, and trade. The above studies demonstrate that researchers have primarily focused on corn producers, corn demand, and corn prices, but have not thoroughly analyzed the impact of corn production policies on the development of the livestock industry, particularly poultry.

Government policies on corn production have a positive relationship with sustainable corn commodity agriculture through the development of agroindustry (Kutu & Kitonga, 2025; Tleuberdinova, Nurlanova, Alzhanova, & Salibekova, 2025). The development of the corn agroindustry can produce numerous byproducts from corn, including feed, fermentation products, nutrient extracts, and corn gluten for animal feed (Jiao, Chen, Han, & Chang, 2022; Zhang et al., 2021). Corn prices have a significant impact on the development of the livestock industry and the growth of agricultural processing companies (Shen & Qiu, 2024). The impact of higher corn prices on feed costs is that a \$0.10 increase in corn prices results in a \$0.86 increase in feed costs per hundredweight (cwt) (Langemeier, 2022). This indicates that feed supply is closely related to corn production and corn prices.

Based on previous research findings, which generally conducted partial analyses of corn production, corn supply, corn demand (especially food consumption), and the effect of corn prices on animal feed separately, this study will conduct a simultaneous analysis of corn self-sufficiency policies and poultry industry development policies. In this regard, we aim to fill the existing research gap. This study is important because the government's policy on corn self-sufficiency, especially in Indonesia, has the primary objective of producing corn commodities for poultry feed.

In light of the above background, the detailed objectives of this study are: (1) to analyze the effect of harvested land area, seed use, fertilizer, pesticides, and agricultural tools and machinery on corn production; (2) to analyze the effect of corn prices on corn supply; (3) to analyze the effect of corn supply on corn prices; and (4) to analyze the effect of corn input prices on the demand for corn inputs for the poultry industry.

## 2. LITERATURE REVIEW

Food self-sufficiency refers to a country's ability to meet its domestic food needs through domestic production. Some countries strive to achieve food self-sufficiency for international trade (Clapp, 2017a). Food self-sufficiency policies are more closely related to the domestic capacity to increase food production. However, some countries still engage in exports and imports (Clapp, 2017b). The above opinion suggests that some countries implement food self-

sufficiency policies while remaining actively engaged in the international trade of food commodities. Furthermore, the food self-sufficiency policy significantly increased food production and food security (Nik Sharifulden, 2023; Reza, Noer, & Satrianto, 2024).

### 2.1. Corn Self-Sufficiency Policy

The Indonesian government has implemented various corn self-sufficiency policies, including: (1) Price subsidies, which were implemented from 2005 to 2017. The government's policy involves providing seed price discounts to farmers. (2) Premium seed direct aid; this policy was implemented from 2007 to 2015, and the policy takes the form of providing certified seeds free of charge to non-hybrid and hybrid corn farmers. (3) Special efforts, such as irrigation improvements, assistance, use of agricultural technology, and farmer empowerment. This policy has been implemented from 2015 to the present (Freddy & Gupta, 2018). (4) Restrictions on corn imports; this policy is based on the Ministry of Trade Regulation No. 21 of 2018. (5) Indonesia's national corn self-sufficiency policy is implemented through the development of agricultural areas in corn production centers (Coordinating Ministry for Economic Affairs of the Republic of Indonesia, 2022). The above policies demonstrate the various efforts made by the Indonesian government to achieve food self-sufficiency.

Agricultural policies aimed at significantly increasing domestic food production have led to increased corn yields and expanded corn fields (Manzamasso, Acharya, & Blayney, 2016). In addition to land area, the use of agricultural technology, including seed varieties, fertilizers, pesticides, agricultural machinery, irrigation, crop rotation, and pest control, significantly increases corn production (Bond, 2025). Next, government policies have simultaneously increased production capacity (Poernomo, 2017; Sentosa et al., 2025). Incentive policies have significantly increased productivity and agricultural production growth (Hendricks, Smith, Villoria, & Stigler, 2023). Subsidy policies have a significant impact on increasing productivity and influencing the behavior of farming households in corn production (Ye et al., 2024). Irrigation policies have a significant impact on increasing productivity, production, income, and consumption of farming households (Shikur, 2020). The findings above suggest that the government can enhance agricultural production and productivity by implementing targeted policies.

### 2.2. The Link Between Production Policy and Corn Supply

The self-sufficiency policy, namely efforts to increase corn production, directly affects corn supply. Self-sufficiency policies can increase domestic corn production, thereby reducing the risk of price and supply fluctuations (Clapp, 2017a). Government policies in agriculture primarily aim to increase the supply of agricultural products effectively (Li, 2023). Agricultural policies aim to produce high-quality food supplies (Pate, 2020). The corn supply comprises production, imports, and initial stock, with the majority of the supply originating from corn production, accounting for approximately 64.7% of the total corn supply (Shen & Qiu, 2024). Corn supply can be measured by corn productivity (Magfiroh, Zainuddin, & Setyawati, 2018). Many factors determine corn supply, including land area, soybean prices, corn prices, labor wages, input prices, subsidies, agricultural machinery and equipment assistance, feed prices, and import prices (Ariyanto, Mubarakah, & Hendrarini, 2023; Magfiroh et al., 2018). International corn prices affect the supply quantity, and the supply quantity also influences the price of corn. If there is an increase in the supply of corn, the price of corn will decrease (Shen & Qiu, 2024). Pricing policies, primarily in the form of guaranteed support prices (GSP) for farmers, serve as incentives for corn supply, encouraging farmers to increase production. Thus, this policy promotes increased corn production (Guda, Dawande, Janakiraman, & Rajapakshe, 2021).

At the global level, the increase in corn production is attributed to rising demand for corn (Erenstein et al., 2022). Based on analysis in China, the policy to increase corn production is carried out in major producing regions by optimizing the corn planting structure. These policies have enabled the maintenance of a corn supply surplus. The implementation of these policies can achieve equilibrium between corn supply and demand, as well as reduce price

fluctuations (Shen & Qiu, 2024). Increased corn production and productivity can strengthen national corn availability, potentially reducing dependence on imported food and feed ingredients (Prasetyo & Sari, 2024). Furthermore, a well-designed corn marketing system will achieve stable supply and prices, as well as increased corn production (Hunga & Culas, 2019). Thus, it can be concluded that policies aimed at increasing corn production serve as a means of controlling corn supply and prices.

### 2.3. Determinants of Corn Prices and Price Transmission

Based on the Cobweb theory, which posits that commodity prices in the previous period are a determining factor in current commodity production, current agricultural product prices will, in turn, determine future agricultural product prices (Xie & Wang, 2017). Protectionist policies in agriculture will increase commodity prices above equilibrium prices (Kumar, Aziz, & Shafiwu, 2024). Fluctuations in corn prices are significantly influenced by changes in agricultural policy (Shen & Qiu, 2024). The interaction between supply and demand for agricultural products will determine prices in the agricultural commodity market. From the supply side, the condition of the input market will affect fluctuations in agricultural output prices because it constitutes the production costs of farming households (Nigatu, Badau, Seeley, & Hansen, 2020). So many factors influence corn prices, including production volume, supply, and agricultural production costs (Tong, 2012). Further results of the study Guo et al. (2023) found that corn price fluctuations are significantly determined by production variables, production costs, household income, corn demand, wheat prices, and Shen and Qiu (2024) found in their study that corn prices are determined by supply and demand factors, substitution prices, and international corn prices. Suh and Moss (2017) found that an increase in corn prices reduces demand for corn but increases demand for substitute commodities. Conditions in the global market will have a significant impact on the agricultural market Bórawski, Beldycka-Borawska, and Dunn (2018). Studies by Ceballos, Hernandez, Minot, and Robles (2017) found that the international corn market has an impact on the domestic corn market. Study Emediegwu and Rogna (2024) found a significant correlation between local and international corn prices, with the elasticity of transmission of international corn prices to local prices being relatively strong, with the lowest estimated value being 0.82%.

Based on the above literature review, there are several market levels in corn product marketing, including the producer market (farmers), local market, national market, and international market. In this regard, it is important to understand price transmission, which is the process of price changes from one market level to another, for example, from the corn market to the poultry feed market.

In the context of corn commodities, price transmission is an important issue because corn is closely linked to the poultry farming sector as the main raw material for feed. The study by Iqbal and Babcock (2016) found that the transmission of corn prices from the global market to the domestic market often exhibits an asymmetric nature, as indicated by price increases being passed on more quickly than price decreases. Furthermore, the study by Mallory, Peng, Ma, and Wang (2025) shows that there is heterogeneity in price transmission between regions, so that the response of feed input prices to domestic corn prices is not uniform. When reviewing previous studies on corn price transmission in Indonesia, studies Suryana (2018) and Hutasoit, Siregar, and Siregar (2020) examined corn price transmission with soybean and rice substitution production.

### 2.4. Demand for Corn as Livestock Feed

Corn is a food crop with various uses, primarily for feed and food. Globally, dry corn is mainly used for feed, accounting for 56% of total production; 20% is used for non-food purposes, and 13% is used for food (Erenstein et al., 2022). In Indonesia, corn is used for animal feed at approximately 58% and for human consumption at around 30%. The feed requirement for the poultry industry accounts for 87% of the supply (Freddy & Gupta, 2018). Chicken feed is a method to incorporate the value of corn and soybean meal as the primary sources of energy and protein for chickens (Wilson et al., 2021). This indicates that the poultry industry's inputs do not only come from corn but also

from other sources. However, the study by [Suh and Moss \(2017\)](#) found that corn is the primary input for animal feed, so an increase in corn prices will have an impact on feed production costs and livestock production. An increase in corn prices has a positive impact on the demand for feed grains and a negative impact on livestock supply.

The increase in consumer demand for livestock products, such as chicken and eggs, has an impact on the rising demand for animal feed, which is primarily corn ([Rozi et al., 2023](#)). The increase in corn prices has a corresponding impact on the rise in broiler chicken prices. Therefore, corn prices have a significant influence on broiler chicken prices ([Šarac et al., 2023](#)). Corn prices have a positive correlation with poultry meat prices ([Onuche, 2021](#)). In this context, the factors influencing corn demand include the increase in feed demand to meet global meat consumption ([Saavoss, Capehart, McBride, & Efland, 2021](#)). In addition, livestock and milk prices are linked to feed crop prices, given that feed is an input for the sector ([Nigatu et al., 2020](#)).

The poultry industry's demand for corn products is a derived demand, meaning that it originates from the demand for poultry products themselves ([Bond, 2025](#)). Thus, the demand for inputs for agricultural production processes is a derived demand. According to [Debertin \(2012\)](#), mathematically, the demand for inputs can be derived using the Cobb-Douglas production function as follows:

Form of production function.

$$Y = AK^{\alpha} L^{\beta} \quad (1)$$

The profit function is:

$$\pi = pY - rK - wL \quad (2)$$

$$\pi = p \cdot AK^{\alpha} L^{\beta} - rK - wL \quad (3)$$

The first order conditions for profit maximization are

$$\frac{\delta \pi}{\delta K} = \alpha p A K^{\alpha-1} L^{\beta} - r = 0 \quad (4)$$

$$\frac{\delta \pi}{\delta L} = \beta p A K^{\alpha} L^{\beta-1} - w = 0 \quad (5)$$

The demand function for input K, with the solution of equation (4) as the first-order condition, is;

$$K^{\alpha-1} \frac{r}{\alpha p A L^{\beta}} \quad (6)$$

So the value of input K is

$$K^* = \left( \frac{\alpha p A}{r} \right)^{\frac{1}{1-\alpha}} L^{\frac{\beta}{1-\alpha}} \quad (7)$$

From [Equation 7](#), the determining factors for input K demand are input K price (r), output price (p), and other input quantities (L). The same applies to the determining factors for input L demand.

### 3. METHODOLOGY

This study utilizes secondary data in the form of panel data from 14 provinces in Indonesia, specifically those that produce corn and have poultry industries, spanning the period from 2015 to 2024, comprising a total of 140 observations. The data is sourced from the Center for Agricultural Data and Information Systems of the Secretariat General of the Ministry of Agriculture, which provides corn outlook and corn trade performance information. Additionally, the data is sourced from the Indonesian Central Statistics Agency, which provides poultry farming company statistics, as well as other related sources.

The corn self-sufficiency policy aims to increase national corn production to ensure the availability of domestic corn supplies and maintain stable corn prices. National corn supplies affect corn prices; the higher the supply, the lower the corn price. High corn prices encourage farming households to increase corn supplies. This indicates a correlation between corn supply and corn prices. The most significant demand for national corn production is for animal feed, particularly poultry feed. The demand for corn inputs in the livestock industry is correlated with prices;

the higher the corn price, the lower the demand for corn inputs for animal feed, and vice versa. Figure 1 shows this relationship through the Conceptual framework of the relationship between corn self-sufficiency policy and the poultry industry.

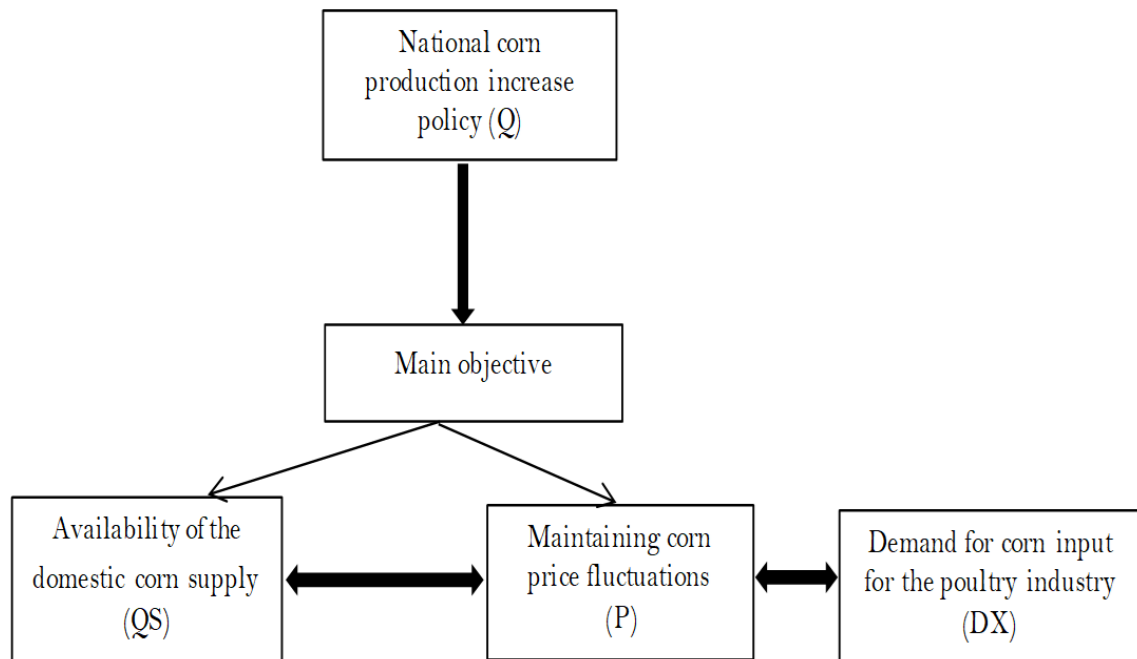


Figure 1. Conceptual framework of the relationship between corn self-sufficiency policy and the poultry industry.

The data was analyzed using panel data regression. The panel data regression model is presented in Equation 8.

$$Y_{it} = \beta_{0it} + \sum_{k=1}^n \beta_k X_{kit} + \varepsilon_i \quad (8)$$

Description,  $Y_{it}$  = Endogenous variable in unit  $i$  and time period  $t$ ,  $X_{kit}$  = Exogenous variable  $k$  in unit  $i$  and time period  $t$ , with  $k=1,2,\dots,n$ ,  $\beta_0$  = Intercept (constant),  $\beta_k$  = Regression coefficient indicating the effect of variable  $X_k$  on  $Y$ ,  $\varepsilon_{it}$  = Error term in unit  $i$  and period  $t$ ,  $i = 1,2,\dots,N$  = Cross-section unit index,  $t = 1,2,\dots,T$  : Time period index (time series).

In panel data analysis, there are three approaches, namely: 1) common effect (method: based on OLS estimation); 2) fixed effect model, data estimated using the Least Squares Dummy Variable (LSDV) approach; and 3) random effect model. Data estimation is performed using the Generalized Least Squares (GLS) method. To test the suitability, the Chow test, the Hausman test, and the Lagrange Multiplier (LM) test are used. In the panel data study to be estimated, the following data are included: corn production function data, corn supply function data, corn price function data, and corn demand function data for poultry feed. The function form and equation are as follows:

Corn production function model

$$Q_{it} = \beta_0 + \sum_{k=1}^5 \beta_k X_{k,it} + \varepsilon_{it} \quad (9)$$

Description;  $Q_{it}$  = Corn production in agricultural business unit  $i$  and period  $t$ , measured in tons per year,  $\beta_0$  = constant,  $\beta_k$  =  $k$ th variable regression coefficient,  $X_{1,it}$  = area of corn farming land (Hectares),  $X_{2,it}$  = amount of corn seed used (kg/ha),  $X_{3,it}$  = amount of fertilizer used (kg/ha),  $X_{4,it}$  = amount of pesticide used (liters per hectare),  $X_{5,it}$  = number of agricultural tools and machinery units,  $\varepsilon_{it}$  = error term.

From (9) a multiple linear regression equation is formed.

$$Q_{it} = \alpha + \alpha_1 X_{1,it}^{a1} + \alpha_2 X_{2,it}^{a2} + \alpha_3 X_{3,it}^{a3} + \alpha_4 X_{4,it}^{a4} + \alpha_5 X_{5,it}^{a5} + \varepsilon_{it} \quad (10)$$

Description,  $\alpha$  = constants.  $\alpha_1, \alpha_5$  = regression coefficients, and  $\varepsilon$  = disturbance error.

Corn supply function model,

$$QS_{it} = \beta_0 + \beta_1 P_{it} + \beta_2 r_1 + \beta_3 r_2 + \beta_4 IP_{it} + \beta_5 Peedp_{it} + \beta_6 X_5 + \varepsilon_{it} \quad (11)$$

Corn supply equation

$$\text{LogQS}_{it} = \beta_0 + \beta_1 \text{LogP}_{it} + \beta_2 \text{Logr}_{1it} + \beta_3 \text{Logr}_{2it} + \beta_4 \text{LogIP}_{it} + \beta_5 \text{LogFeed}_{it} + \beta_6 \text{LogX}_5 + \varepsilon_{it} \quad (12)$$

Description;  $Q_s$  = Supply,  $P$  = Corn price,  $r_1$  = Price of seeds,  $r_2$  = Price of urea fertilizer

$IP$  = Import price,  $X_5$  = Agricultural tools and machinery.

$b$  = Constants,  $b_1, \dots, b_6$  regression coefficient.

Corn Price Function

$$P = f(Q_s, D_x, SP, GP, IP) \quad (13)$$

Corn price equation model

$$\log P = \log \theta + \theta_1 \log Q_s + \theta_2 \log D_x + \theta_3 \log SP + \theta_4 \log GP + \theta_5 \log IP + \log \varepsilon \quad (14)$$

Description;  $P$  = Corn price,  $Q_s$  = Corn supply,  $D_x$  = Industrial feed corn demand,

$SP$  = Soybean price,  $GP$  = Rice price,  $IP$  = Import price

Soybean and rice prices are used as control variables in corn price analysis because soybeans and grain can be used as animal feed. Soybeans (especially in the form of meal or waste products such as hulls and boiled water) are a good source of protein and energy for various types of livestock, while grain is a source of energy for livestock, especially poultry.

Corn input demand function

$$D_x = f(r_x, K_1, K_2, L, p_1, p_2) \quad (15)$$

Equation model for corn input demand in poultry farming

$$\log D_x = \log \beta_0 + \beta_1 \log r_x + \beta_2 \log K_1 + \beta_3 \log K_2 + \beta_4 \log L + \beta_5 \log p_1 + \beta_6 \log p_2 + \log \varepsilon \quad (16)$$

Description;  $D_x$  = corn input demand  $r_x$  = Corn input prices  $K_1$  = concentrate

$K_2$  = Feed,  $L$  = Labor,  $p_1$  = Egg-laying chickens price,  $p_2$  = Broiler chicken breeds price.

$\varepsilon$  = Error term.

Endogeneity test using the Hausman test or the Durbin-Wu-Hausman test.

**Table 1.** Hausman test for endogeneity.

| Test summary                                       | Chi-sq. statistic | Chi-Sq. d.f. | Prob. | Description |
|----------------------------------------------------|-------------------|--------------|-------|-------------|
| Corn supply equation<br>Cross-section random       | 39.53             | 6            | 0.00  | Endogenous  |
| Corn price equation cross-section random           | 53.87             | 5            | 0.00  | Endogenous  |
| Corn input demand equation<br>Cross-section random | 14.25             | 6            | 0.03  | Endogenous  |

Based on Table 1, if the p-value is  $< 0.05$ , it indicates the occurrence of endogeneity, while if the p-value is  $\geq 0.05$ , there is no endogeneity in the equation. Thus, in the corn supply equation, the corn price and corn demand are related through a problem of endogeneity.

This study employs simultaneous panel data analysis due to an endogeneity problem involving the variables  $Q_s$  (corn supply),  $P$  (corn price), and  $D_x$  (corn input demand). The endogenous nature of  $Q_s$ ,  $P$ , and  $D_x$  causes their correlation with the residuals, leading to biased estimates if ordinary least squares (OLS) is used. Consequently, it is necessary to conduct the following identification tests before proceeding.

The structural supply model and price equation are as follows:

$$\log Q_s = \log b + b_1 \log \hat{P} + b_2 \log r_1 + b_3 \log r_2 + b_4 \log IP + b_5 \log \text{Feedp} + b_6 \log X_5 + \log \varepsilon_1 \quad (17)$$

$$\log P = \log \theta + \theta_1 \log \hat{Q}_s + \theta_2 \log D_x + \theta_3 \log SP + \theta_4 \log GP + \theta_5 \log IP + \log \varepsilon_2 \quad (18)$$

$$\log D_x = \log \beta_0 + \beta_1 \log r_x + \beta_2 \log K_1 + \beta_3 \log K_2 + \beta_4 \log L + \beta_5 \log p_1 + \beta_6 \log p_2 + \log \varepsilon_3 \quad (19)$$

Identification test, for Equations 17, 18 and 19,  $K - k > m - 1$  or over-identified.

## 4. RESULTS AND DISCUSSIONS

### 4.1. Results

#### 4.1.1. Descriptive Statistics

The results of the descriptive statistical analysis are presented in Table 2. In the study area, the average corn production was 1,127,525 tons per year. When compared to the average land area, the average productivity per hectare in the study area was 6.68 tons per year. The corn production mentioned above was achieved through a combination of inputs, including: seeds totaling 3,877.24 tons, fertilizers totaling 52,456.43 tons, pesticides totaling 325,292.3 liters, and agricultural tools and machinery totaling 1,647 units. The highest corn production in the study area was 9,602,000 tons, and the lowest was 12,677 tons. This is likely due to differences in corn cultivation areas between provinces in corn-producing regions.

Table 2 presents data on the average corn supply in the study area, which is 5,604.90 kg per hectare. Several variables are believed to influence corn supply, including the price of corn itself, the cost of seeds, the price of fertilizer, the price of imports, the cost of animal feed, and the expense of agricultural tools and machinery. In this context, fluctuations in the prices of the above variables affect fluctuations in corn supply in the study area. The highest supply was 7,679 kg per hectare, while the lowest was 3,278 kg per hectare. This difference is likely due to variations in farmers' responses to corn prices and may also be influenced by climatic factors.

The average corn price in the study area (Table 2) was Rp. 4,133.21 per kg, with the highest price at Rp 5,900 per kg and the lowest at Rp 2,700 per kg. These price differences are likely due to regional variations, resulting in differing transportation costs for corn marketing. Many factors influence fluctuations in corn prices, including corn supply availability, demand in the poultry industry, soybean prices, rice prices, and imported corn prices.

Corn is the primary feed for poultry; therefore, it plays a crucial role in supporting the development of the poultry industry. The data in Table 2 show that the average demand for corn input in the poultry industry is 2,118,200 kg per year, which is used to produce various products, including laying hens, broilers, both adult and chick birds, and other products. Corn input demand in the poultry industry is determined by various factors, including the price of corn input itself, the price of the output produced (broiler chickens and laying hens, both adult and young), the amount of concentrate, the amount of feed, and the number of workers. The highest demand for corn input is 10,764,890 kg, and the lowest is 12,900 kg. The difference in corn input usage in the poultry industry is likely due to differences in business scale.

**Table 2.** Descriptive statistics of research variables.

| Variable       | Description                              | Mean      | Std. dev. | Max        | Min.   |
|----------------|------------------------------------------|-----------|-----------|------------|--------|
| Q              | Corn production (Tons)                   | 1.127.525 | 1.545.642 | 9.602.000  | 12.677 |
| X <sub>1</sub> | Harvested land area (Ha)                 | 168.840.7 | 197.099.7 | 817.449    | 35     |
| X <sub>2</sub> | Seeds tons                               | 3.877.24  | 5.014.86  | 20.436     | 4.25   |
| X <sub>3</sub> | Fertilizer tons                          | 52.456.43 | 66.885.56 | 286.107    | 438    |
| X <sub>4</sub> | Pesticides liters                        | 325.292.3 | 382.755.5 | 1.594.026  | 2.439  |
| X <sub>5</sub> | Agricultural tools and machinery (Units) | 1.647.42  | 1.983.4   | 8.174      | 13     |
| Qs             | Supply corn (kg/ha)                      | 5.604.90  | 1.069.53  | 7.679      | 3.278  |
| P              | Corn price (Rp/Kg)                       | 4.133.21  | 803.49    | 5.900      | 2.700  |
| r1             | Seed prices (Rp/Kg)                      | 107.508.6 | 21.897.73 | 150.000    | 31.000 |
| r2             | Fertilizer prices (Rp/Kg)                | 2.148.21  | 302.47    | 3.200      | 1.500  |
| Ss             | Seed subsidies (Rp/Kg)                   | 59.383.5  | 4.418.51  | 70.500     | 47.500 |
| Feedp          | Feed price (Rp/Kg)                       | 7.527.1   | 2.121.99  | 12.500     | 3.500  |
| Dx             | Demand for feed corn input (Kg)          | 2.118.200 | 2.054.340 | 1.0764.890 | 12.900 |
| Soyp           | Soybean prices (Rp/Kg)                   | 9.373.5   | 639.96    | 10.800     | 8.250  |
| Gp             | grain price (Rp/Kg)                      | 5.293.6   | 756.66    | 6.600      | 4.000  |
| Ip             | Import price (Rp/Kg)                     | 4.566.69  | 1.080.47  | 8.730      | 2.900  |
| r              | Corn input prices (Rp/Kg)                | 4.133.21  | 803.49    | 5.900      | 2.700  |
| p <sub>1</sub> | Egg-laying chickens price (Rp/Tail)      | 115.005.7 | 46.193.18 | 196.000    | 47.500 |
| p <sub>2</sub> | Broiler chicken breeds price (Rp/Tail)   | 31.890.83 | 8.743.29  | 47.500     | 19.000 |

| Variable       | Description            | Mean       | Std. dev.  | Max         | Min.    |
|----------------|------------------------|------------|------------|-------------|---------|
| K <sub>1</sub> | concentrate            | 60.772.146 | 85.455.647 | 345.523.557 | 183.111 |
| K <sub>2</sub> | Feed (Kg)              | 6.0542.496 | 77.801.705 | 327.000.000 | 214.780 |
| L              | Labor (Million People) | 1.304.16   | 2.062.22   | 9.346       | 11      |

Note: \*Kg =kilogram \* Rp = Rupiah is the currency of Indonesia \*ha = hectare.

The corn production panel data analysis model consists of common effect, fixed effect, and random effect models. In this regard, it is necessary to test the suitability of these three models using the Chow test and the Hausman test as follows:

**Table 3.** Chow test results for corn production.

| Effects Test             | Statistic | d.f.     | Prob. |
|--------------------------|-----------|----------|-------|
| Cross-section F          | 3.36      | (13,121) | 0.00  |
| Cross-section Chi-square | 43.23     | 13       | 0.00  |

Table 3 shows the results of the Chow test for corn production, where the probability value of  $0.00 < 0.05$  indicates that  $H_0$  is rejected and  $H_1$  is accepted. Therefore, the fixed effects model is more appropriate than the common effects model. Table 4 presents the results of the Hausman test on corn production. Based on Table 4, fixed effects are more appropriate than common effects.

**Table 4.** Hausman test results for corn production.

| Test summary         | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob. |
|----------------------|-------------------|--------------|-------|
| Cross-section random | 17.27             | 5            | 0.00  |

Based on the results of the Hausman test in Table 4, the probability value is  $0.00 < 0.05$ , so  $H_0$  is rejected and  $H_1$  is accepted. Therefore, the fixed effects model is selected as the appropriate model for estimating corn production. Based on Table 5, the fixed effects model is the appropriate model for estimating corn production.

**Table 5.** Fixed effects model for estimating corn production functions (log Q).

| Variable           | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|------------|-------------|-------|
| C                  | 3.60        | 0.81       | 4.43        | 0.00  |
| log X <sub>1</sub> | 0.04        | 0.02       | 1.99        | 0.04  |
| log X <sub>2</sub> | 0.26        | 0.12       | 2.13        | 0.03  |
| log X <sub>3</sub> | 0.04        | 0.02       | 2.20        | 0.02  |
| log X <sub>4</sub> | 0.53        | 0.13       | 4.12        | 0.00  |
| log X <sub>5</sub> | 0.05        | 0.01       | 3.70        | 0.00  |
| R <sup>2</sup>     | 0.9922      |            |             |       |
| F-statistic        | 857.61      |            |             |       |
| Prob(F-statistic)  | 0.00        |            |             |       |

Table 5 presents the results of the fixed-effects panel data regression estimation of the factors influencing corn production. Based on the estimation results, an R<sup>2</sup> value of 99.22 was obtained, indicating that the inputs of harvested land area, seed use, fertilizer, pesticides, and agricultural tools and machinery contribute 99.22 percent to corn production, with the remaining 0.78 percent attributed to other variables not included in the model.

The variable of harvested land area has a regression coefficient of 0.04 and is significant at the 5% level for corn production. This indicates that a one percent increase in harvested area will increase corn production by 0.04 percent, assuming ceteris paribus. Seed use has a regression coefficient of 0.26 and is significant at the 5% level for corn production. This finding suggests that as seed use increases, corn production also increases, assuming other factors

remain constant. The fertilizer variable has a regression coefficient of 0.04, which is significant at the 5% level for corn production.

The results of this study indicate that a one percent increase in fertilizer use will increase corn production by 0.04 percent, assuming *ceteris paribus*. Pesticide use has a regression coefficient of 0.53 and is significant at the 1% level. This finding indicates that a one percent increase in pesticide use has a 0.53 percent impact on corn production, assuming *ceteris paribus*. The use of agricultural tools and machinery also has a positive and significant effect on corn production. The regression coefficient value is 0.05, which is significant at the 1% level. These results indicate that a one percent increase in the use of agricultural tools and machinery will increase corn production by 0.05 percent, assuming other factors remain constant.

The corn supply panel data analysis model consists of common effect, fixed effect, and random effect models. In this regard, it is necessary to test the suitability of the three models using the Chow test and the Hausman test as follows:

**Table 6.** Chow test result for corn supply.

| Effects Test             | Statistic | d.f.     | Prob. |
|--------------------------|-----------|----------|-------|
| Cross-section F          | 6.16      | (13,120) | 0.00  |
| Cross-section Chi-square | 71.60     | 13       | 0.00  |

Table 6 shows the results of the Chow test, where the probability value of  $0.00 < 0.05$ , indicates that  $H_0$  is rejected and  $H_1$  is accepted. Therefore, the fixed effects model is more appropriate than the common effect model for estimating corn supply.

**Table 7.** Hausman test result for corn supply.

| Test summary         | Chi-sq. statistic | Chi-Sq. d.f. | Prob. |
|----------------------|-------------------|--------------|-------|
| Cross-section random | 39.53             | 6            | 0.00  |

In Table 7, the results of the Hausman test are presented with a probability value of  $0.00 < 0.05$ . This indicates that  $H_0$  is rejected and  $H_1$  is accepted, suggesting that the fixed effects model is more appropriate than the random effects model for estimating corn supply. The estimation results using the fixed effects model in stage 1 and the simultaneous panel TSLS (stage II) corn supply equation are shown in Table 7.

The estimation results show differences between Stage I and Stage II. The  $R^2$  value for Stage I is 0.6532, which is lower than the  $R^2$  value for TSLS, which is 0.6628. The difference in  $R^2$  values is likely due to endogeneity issues; therefore, simultaneous panels can be used to overcome endogeneity problems. The TSLS fixed effects model estimation results (Table 8) show that the corn price variable has a regression coefficient of 0.25. This figure indicates that a one percent increase in corn prices will result in a 0.25 percent increase in corn supply, placing it in the inelastic category.

From this supply elasticity figure, it can be inferred that the corn supply is sensitive to price changes. The p-value of 0.01 indicates that corn prices have a positive and significant effect on corn supply, meaning that as corn prices increase, corn supply also increases, *ceteris paribus*. In addition to the corn price variable, the corn supply estimation also uses seed prices, fertilizer prices, import prices, feed prices, and the use of agricultural machinery as control variables. Based on the estimation results, the control variables indicate that corn supply is significantly influenced by import prices and the use of agricultural machinery.

**Table 8.** Fixed effect model stage I and TSLS (stage II) estimation results, Corn supply (log Qs).

| Variable           | Stage I     |             |       | TSLS (Stage II) |             |       |
|--------------------|-------------|-------------|-------|-----------------|-------------|-------|
|                    | Coefficient | t-statistic | Prob. | Coefficient     | t-statistic | Prob. |
| log P              | 0.18        | 1.98        | 0.05  | 0.25            | 2.73        | 0.00  |
| log r <sub>1</sub> | -0.32       | -3.23       | 0.00  | -0.33           | -3.46       | 0.00  |
| log r <sub>2</sub> | -1.05       | -5.57       | 0.00  | -0.98           | -5.14       | 0.00  |
| log IP             | 0.54        | 5.40        | 0.00  | 0.63            | 6.55        | 0.00  |
| log Feedp          | 0.45        | 3.05        | 0.00  | 0.46            | 3.15        | 0.00  |
| logX <sub>5</sub>  | 0.05        | 2.12        | 0.04  | 0.05            | 2.44        | 0.03  |
| Constant           | 9.91        | 11.02       | 0.00  | 10.26           | 11.92       | 0.00  |
| R <sup>2</sup>     | 0.65        |             |       | 0.66            |             |       |
| F-statistic        | 11.90       |             |       | 12.42           |             |       |
| Prob(F-statistic)  | 0.00        |             |       | 0.00            |             |       |
| Total observations | 140         |             |       | 140             |             |       |

The corn price (Table 9) panel data analysis model consists of common effect, fixed effect, and random effect models. In this regard, it is necessary to test the suitability of these three models using the Chow test and the Hausman test as follows:

**Table 9.** Chow test. Result for corn price

| Effects Test             | Statistic | d.f.     | Prob. |
|--------------------------|-----------|----------|-------|
| Cross-section F          | 15.74     | (13,121) | 0.00  |
| Cross-section Chi-square | 138.56    | 13       | 0.00  |

Table 9 shows the results of the Chow test, where the probability value of  $0.00 < 0.05$  indicates that  $H_0$  is rejected and  $H_1$  is accepted. Therefore, the fixed effects model is more appropriate than the common effect model. In Table 10, the p-value is  $< 0.05$ , indicating that  $H_0$  is rejected, so the random effect model is not adequate.  $H_a$  is accepted, meaning that the fixed effect model is more appropriate than the random effect model.

**Table 10.** Hausman test. result for corn price.

| Test summary         | Chi-sq. statistic | Chi-Sq. d.f. | Prob. |
|----------------------|-------------------|--------------|-------|
| Cross-section random | 53.87             | 5            | 0.00  |

The results of the fixed effects model estimation for stages I and II, specifically TSLS, on the effect of corn supply on corn prices are presented in Table 11. The estimation results show that the  $R^2$  value for stage I is 0.9482, which is higher than the  $R^2$  value for stage II TSLS, which is 0.9411, indicating the possibility of endogeneity. The TSLS estimation results, which have a lower  $R^2$  value, can be used to address the endogeneity issue. The TSLS  $R^2$  value of 0.9411 indicates that the contribution of the supply variables, including corn input demand, soybean prices, rice prices, and corn import prices, to corn prices is 94.11%, with the remaining 5.89% influenced by other factors not included in the model.

In Table 11, the fixed effect model shows that the TSLS coefficient value for the corn supply variable is -0.13, indicating that a one percent increase in corn supply will decrease the price of corn by 0.13 percent. Based on the p-value of 0.02, it indicates that the supply variable has a significant effect on the price of corn at the 5% level. This finding suggests that the higher the corn supply, the lower the corn price, assuming all other factors remain constant. In addition to the corn supply variable, the model includes corn demand, soybean price, rice price, and corn import price as control variables in the simultaneous panel estimation of the corn price function. The control variables above, except for the rice price, have a significant effect on the corn price.

**Table 11.** Estimated results of the least squares panel and TSLS corn price function fixed effect model.

| Variable           | Stage I     |             |       | Stage II TSLS |             |       |
|--------------------|-------------|-------------|-------|---------------|-------------|-------|
|                    | Coefficient | t-statistic | Prob. | Coefficient   | t-statistic | Prob. |
| log Q <sub>s</sub> | -0.24       | -4.82       | 0.00  | -0.13         | -2.44       | 0.02  |
| log D <sub>x</sub> | 0.01        | 1.81        | 0.07  | 0.01          | 1.80        | 0.07  |
| log Sp             | 0.24        | 1.75        | 0.08  | 0.20          | 1.37        | 0.17  |
| log Gp             | 0.97        | 11.43       | 0.00  | 1.03          | 11.45       | 0.00  |
| log Ip             | 0.08        | 1.83        | 0.07  | 0.123         | 2.60        | 0.01  |
| C                  | -2.63       | 5.50        | 0.00  | -2.74         | 3.84        | 0.00  |
| R <sup>2</sup>     | 0.948       |             |       | 0.9411        |             |       |
| F-statistic        | 123.16      |             |       | 107.58        |             |       |
| Prob(F-statistic)  | 0.00        |             |       | 0.00          |             |       |

The corn price panel data analysis model consists of common effect, fixed effect, and random effect models. In this regard, it is necessary to test the suitability of the three models using the Chow test and the Hausman test as follows: Panel data estimation of corn input demand is performed using three models, namely fixed effects, common effects, and random effects. In this regard, to determine the appropriate estimation model, the Chow test and the Hausman test are performed. The results of the Chow test are presented in Table 12.

**Table 12.** Chow test result for corn input demand.

| Effects test             | Statistic | d.f.     | Prob. |
|--------------------------|-----------|----------|-------|
| Cross-section F          | 11.03     | (13,120) | 0.00  |
| Cross-section Chi-square | 110.06    | 13       | 0.00  |

Table 12 shows the results of the Chow test, where the probability value of  $0.00 < 0.05$ , indicate that  $H_0$  is rejected and  $H_1$  is accepted. Therefore, the fixed effects model is more appropriate than the common effect model.

Based on Table 13, where the p-value is  $< 0.05$ ,  $H_0$  is rejected, and  $H_1$  is accepted, indicating that the fixed effects model is more appropriate than the random effects model.

**Table 13.** Hausman test. result for corn input demand.

| Test summary         | Chi-sq. statistic | Chi-Sq. d.f. | Prob. |
|----------------------|-------------------|--------------|-------|
| Cross-section random | 14.25             | 6            | 0.03  |

Table 14 presents the results of the fixed effect estimation in stage I analysis and stage II of the TSLS analysis of the effect of corn input prices on the determinants of corn input demand in the poultry industry in Indonesia. The R<sup>2</sup> value from stage I is 0.8280, which is relatively similar to the R<sup>2</sup> value from the simultaneous panel TSLS estimation of 0.8283. The TSLS R<sup>2</sup> value of 0.8683 indicates that the contribution of the corn input price variable, the price of laying hen chicks, broiler chicken seed price, concentrate quantity, non-corn feed quantity, and labor quantity to corn input demand in the poultry industry is 86.83%, with the remaining 13.17% influenced by other factors not included in the model.

The results of the TSLS fixed effect model (Table 14) estimation show that the coefficient value of the corn input price variable has a negative sign of 1.52, indicating that a one percent increase in the corn input price will reduce the demand for corn in the poultry industry by 1.52 percent, with the elasticity of demand for corn input falling into the elastic category. Based on the Prob value of 0.00, it indicates that the corn input price variable has a negative and significant effect at the 1% level on the demand for corn input in the poultry industry. This finding suggests that as corn prices rise, poultry industry corn demand decreases, assuming all other factors remain constant. In the TSLS simultaneous panel fixed effect model estimation (Table 14), in addition to the corn input price variable, other variables serve as control variables, namely the prices of laying hens, broiler chickens, concentrate, feed, and labor.

**Table 14.** Results of least squares and TSLS panel estimates of corn demand ( $D_x$ ) model fixed effect.

| Variable          | Stage I     |             |       | TSLS (Stage II) |             |       |
|-------------------|-------------|-------------|-------|-----------------|-------------|-------|
|                   | Coefficient | t-statistic | Prob. | Coefficient     | t-statistic | Prob. |
| $\log r_x$        | -0.53       | -2.58       | 0.01  | -1.52           | 2.66        | 0.00  |
| $\log p_2$        | 0.96        | 4.56        | 0.00  | 0.90            | 4.93        | 0.00  |
| $\log p_1$        | 1.37        | 2.26        | 0.02  | 1.46            | 2.64        | 0.00  |
| $\log K_1$        | 0.07        | 0.61        | 0.54  | 0.07            | 0.66        | 0.50  |
| $\log K_2$        | 0.16        | 0.76        | 0.45  | 0.16            | 0.90        | 0.37  |
| $\log L$          | 0.64        | 2.51        | 0.01  | 0.64            | 2.87        | 0.00  |
| C                 | -14.63      | -2.70       | 0.00  | -19.23          | -4.08       | 0.00  |
| $R^2$             | 0.8280      |             |       | 0.8283          |             |       |
| F-statistic       | 19.09       |             |       | 19.12           |             |       |
| Prob(F-statistic) | 0.00        |             |       | 0.00            |             |       |

#### 4.2. Discussions

Based on the results of the fixed effect panel data estimation in Table 5, The variable of corn harvest area has a positive and significant effect on corn production. The results of the study indicate that the larger the harvest area, the higher the corn production. This finding aligns with the work of Bond (2025) and Zhang, Dong, Wen, and Li (2020), who have shown that the corn farming area has a significant effect on corn production. This finding is relevant to government policies aimed at increasing national corn production in Indonesia through land expansion in corn-producing regions. High-quality corn seeds have a significant impact on corn production (Table 5). This finding is relevant to the studies by Cadet-Díaz and Guerrero-Escobar (2018) and Masese, Mary Mbithi, Joshi, and Masese Machuka (2022), which indicates that the use of high-quality seeds significantly increases corn production. The use of high-quality seeds in corn production will be combined with biological agricultural technologies such as fertilizers and pesticides to enhance domestic corn production.

The use of fertilizers and pesticides has a positive and significant effect on corn production. The results of this study indicate that as the use of fertilizers and pesticides increases, so does corn production. This finding is supported by a study by Zhang et al. (2020) and Zhi et al. (2022) that the use of pesticides and chemical fertilizers effectively increases corn production. Additionally, insecticides have a positive and significant effect on corn production (Cadet-Díaz & Guerrero-Escobar, 2018). Similarly, the use of agricultural tools and machinery has a positive and significant impact on corn production. This finding is supported by a study by Zhi et al. (2022), which states that technological inputs, in the form of agricultural machinery, play a crucial role in corn production, with 62% of the variance in corn production explained by the use of these inputs.

The random effect model's estimated results indicate a positive and significant effect of corn prices on corn supply (Table 8), at the 5 percent level. This finding suggests that as corn prices rise, corn supply also increases, provided that other factors remain constant. The results of this study are consistent with those of Ariyanto et al. (2023), who found that corn prices have a significant impact on corn supply. The positive effect of corn prices on corn supply indicates that the law of supply applies in the domestic corn market. This is partly due to the government's corn self-sufficiency policy, supported by policies on corn prices, specifically the government purchase price (GPP) at the farmer level (National Food Agency, 2022). The government's purchase price policy increases the national corn price (Fitriana, Hanani, & Fahriyah, 2024). This policy benefits farmers (National Food Agency, 2022). Government price-setting policies have a significant impact on the expansion of corn cultivation areas (Edison & Wahyuni, 2020).

Additionally, (Brockhaus et al., 2015) found that farming households respond positively to increases in food crop commodity prices. A study by Goyal et al. (2022) found that an increase in corn prices significantly encourages farmers to expand their cultivated land. A study by Xie and Wang (2017) found that the higher the price of agricultural commodities, the greater the motivation for farmers to increase production, thereby increasing supply, and vice versa. Protectionist policies in agriculture will raise commodity prices above the equilibrium price. These policies have a positive and significant effect on farmers' income and well-being (Kumar et al., 2024).

Based on the results of the second stage of the fixed effect model estimation (Table 11), it can be seen that the corn supply variable has a negative and significant effect on corn prices. This finding indicates that as corn supply increases, corn prices decrease, and conversely, as corn supply decreases, corn prices increase, *ceteris paribus*. This finding is consistent with the study by Tong (2012), which states that corn supply is one of the key factors determining price. The negative and significant effect of corn supply on corn prices is likely due to the fact that in Indonesia, corn cultivation is carried out simultaneously in major production areas, resulting in a bumper harvest. The government has implemented various policies to address this issue, including reference price policies for corn purchases and sales at the farmer level, as outlined in Regulation No. 5/2022 of the National Food Agency. Additionally, there is also Presidential Regulation No. 125/2022, regarding the management of government corn reserves. The government has tasked the logistics agency to act as an off-taker by absorbing corn produced by farmers into the national food reserve for stabilization intervention. This policy has a positive impact on improving corn prices, particularly during the harvest season. However, the study by Zheng, Zhuang, and Qiu (2020) found that the government's policy of purchasing corn for government reserves can cause distortions in the corn market mechanism, thereby failing to reflect actual prices.

In Table 14, corn input demand is significantly influenced by the price of corn input itself at the 5% level. This finding indicates that the higher the price of corn input, the lower the demand for corn input in the poultry industry. An increase in corn input prices will impact poultry production costs, thereby encouraging the poultry farming industry to reduce its use of corn inputs, and vice versa. A study by Umboh, Hakim, Sinaga, and Kariyasa (2014) found that a decrease in corn prices will affect the increase in corn demand in the feed industry. The results of the above study are consistent with those of Suh and Moss (2017), who found that an increase in corn prices will reduce corn demand for animal feed and increase demand for feed grains through substitution effects.

Furthermore, Saavoss et al. (2021) also found that producers will respond to increases in input prices by reducing their use of those inputs (Saavoss et al., 2021). Government policies in agriculture, including those related to corn production, primarily aim to ensure supply (Li, 2023; Pate, 2020). The corn self-sufficiency policy is supported by corn price policies aimed at stabilizing corn prices in the domestic corn market. Corn production enhancement policies are closely linked to poultry industry development, as the majority of domestic corn supply is used for animal feed, particularly poultry feed (Erenstein et al., 2022; Suh & Moss, 2017). In this regard, the government's corn pricing policy will affect the poultry industry. Studies by Umboh et al. (2014), Onuche (2021), and Šarac et al. (2023) found that corn prices have both positive and negative impacts on broiler chicken prices and income from the livestock industry.

## 5. CONCLUSION

This study produced the following conclusions: (1) Partially and simultaneously, the input of harvested land area, use of seeds, fertilizers, pesticides, and agricultural tools and machinery significantly affect corn production. These findings indicate that as the harvested land area, use of seeds, fertilizers, pesticides, and agricultural tools and machinery increase, so does corn production. (2) The corn price variable has a positive and significant effect on corn supply, meaning that as corn prices increase, corn supply also increases, assuming all other factors remain constant. This finding indicates that farmers are responsive to price incentives; when corn prices increase, they tend to increase their production. (3) The corn supply variable has a negative and significant effect on corn prices. This finding indicates that as corn supply increases, corn prices decrease, assuming *ceteris paribus*. The study's finding that an increase in corn supply has a negative impact on corn prices reinforces the basic economic principle that excess supply will depress market prices. (4) The corn input price variable has a negative and significant impact at the one percent level on industrial poultry corn input demand. This finding indicates that the higher the corn price, the lower the demand for corn in the poultry industry, assuming *ceteris paribus*. Thus, an increase in corn prices will raise the cost of poultry feed, which in turn will drive a decrease in demand from the downstream sector. The findings imply that

the government should strengthen efforts to stabilize corn prices during the harvest season through local institutions such as cooperatives, in collaboration with logistics affairs agencies. Moreover, effective supply chain management requires coordinated policies from upstream to downstream sectors, particularly the poultry industry. To achieve this, collaboration among the agricultural department, livestock associations, and poultry industry stakeholders is crucial to ensure the efficient distribution of corn. For further research, analyze the impact of corn self-sufficiency policies on the poultry industry by taking into account broader macroeconomic variables, comparing results across various poultry sub-sectors, reviewing the effects on the corn supply chain, testing policy responses at different regional levels, and using more sophisticated quantitative analysis methods such as simulation modeling.

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