

Market Channel Efficiency and Price Transmission Patterns of Virginia Tobacco in Bojonegoro, Indonesia

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Abstract. This study aims to analyze the marketing channels, marketing efficiency, farmers' share, and price transmission elasticity of Virginia tobacco in Bojonegoro, Indonesia. The applied methods encompass a descriptive quantitative approach through field observations and interviews, complemented by calculations of marketing margins, margin distribution, farmers' share, channel efficiency, and price transmission elasticity. The results indicate that Marketing efficiency analysis indicates that Marketing Channel 1 is more efficient than Marketing Channel 2, reflecting a more optimal margin distribution and a profit share that is more favorable for farmers, allowing them to receive a fairer portion of the supply chain and minimizing dependence on intermediaries. Marketing efficiency in Channel 1 was recorded as superior, indicating relatively lower distribution costs and a more proportional profit allocation. The price transmission elasticity value of 10.62 that changes in prices at the end-market level are transmitted to farmers' prices at a greater proportion, making the prices received by farmers highly responsive to market fluctuations. Farmers should strengthen their bargaining position by forming cooperatives or establishing direct partnerships with processing industries to reduce dependence on dominant traders. Additionally, improving market access, price transparency, and post-harvest management can help stabilize income and minimize the impact of price fluctuations.

1 Introduction

Virginia tobacco holds a strategic position in the national tobacco industry, particularly as a superior variety serving as the primary raw material for kretek and white cigarette

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production. Bojonegoro Regency in East Java Province is recognized as one of the most important production centers for this variety, making Virginia tobacco not merely an agricultural commodity but also a crucial pillar supporting the local community's economy. The added value generated from tobacco farming activities and the welfare of farmers are strongly influenced by the prevailing price mechanisms and marketing systems in the field [1]. This condition indicates that downstream aspects are closely linked to the sustainability of upstream activities, particularly in ensuring the stability of farmers' income. The reality of recent years shows market dynamics that tend to disadvantage farmers, as producer-level prices are considerably lower than those received by wholesalers or final consumers [2, 3]. This situation indicates potential inefficiencies within the marketing chain and market structure, necessitating serious attention from various stakeholders to create a more equitable value distribution.

Lengthy marketing chains are often the cause of the low prices received by farmers. Distribution processes involving multiple parties, such as collectors, wholesalers, and retailers, cause a substantial portion of profits to be absorbed at each intermediary stage [4]. This condition aligns with findings in the horticulture sector, which show that the longer the marketing channel, the smaller the proportion of the price obtained by producers. With the shortest channel proving to provide the highest efficiency and a more equitable profit distribution [5]. A similar pattern was also observed in studies on cut chrysanthemum in Cianjur Regency. Analyses using the Composite Index and Acharya-Aggarwal's method identified the shortest marketing channel, where farmers sell directly to wholesalers and then to consumers, as the most efficient channel. This pattern not only minimizes distribution costs but also accelerates the delivery process and increases farmers' income. These facts indicate that marketing channel efficiency is key to creating a more equitable and balanced distribution of economic value in the agricultural sector [6].

In line with this, price transmission elasticity is an important concept that explains the extent to which price changes at the consumer level are passed on to producers [7]. In the food sector, such as rice and fruit commodities, various studies have found asymmetries in the price transmission process. Price increases at the downstream level tend to be transmitted to farmers more rapidly than price decreases, which often occur more slowly [8]. This phenomenon indicates that market structure affects the balance of profit distribution between upstream and downstream actors. In the context of the tobacco industry, international literature shows that demand for final products, such as cigarettes, exhibits a relatively high responsiveness to price changes [9]. A study in Vietnam found cigarette demand elasticity ranging from 0.3 to 0.8, indicating that price increases significantly reduce demand [10]. Further data show that a 1% increase in cigarette prices can lower smoking prevalence by approximately 0.26% and reduce household expenditure on tobacco by around 0.4%. These facts confirm that pricing policies affect not only consumption but also industry revenue and the welfare of upstream tobacco farmers [1].

Research on marketing channels and price elasticity in agricultural commodities is generally conducted separately. Studies that integrate both aspects simultaneously, particularly on Virginia tobacco in Bojonegoro Regency, remain very scarce. This condition indicates a research gap, considering that the economic sustainability of farmers heavily depends on the efficiency of marketing systems and fairness in price distribution. This gap generates two main focuses. First, there is a lack of comprehensive understanding regarding the structure and performance of Virginia tobacco marketing channels in Bojonegoro. Second, quantitative studies measuring the extent to which market prices are reflected in farmers' income through price transmission elasticity analysis are still limited. Both focuses are important to explain the relationship between market mechanisms and farmers' welfare in greater depth.

Based on this background, the present study is highly urgent to be conducted. This study is designed with three main objectives. First, to identify the marketing channel patterns of Virginia tobacco in Bojonegoro Regency. Second, to evaluate the efficiency of each marketing channel using marketing margin and farmers' share indicators. Third, to examine price transmission elasticity from the final consumer level to farmers. The results of these three focuses are expected to provide actionable policy recommendations to enhance the competitiveness and sustainability of tobacco farming.

2 Methodology

2.1 Research Time and Location

The study was conducted from March to June 2025 in Pohwates Village, Kepohbaru Subdistrict and Kedungsumber Village, Temayang Subdistrict, Bojonegoro Regency. The research location was selected using a purposive sampling technique, considering that Pohwates Village is one of the villages with the largest land area and Virginia tobacco production in Kepohbaru Subdistrict. Kepohbaru Subdistrict ranks highest in Virginia tobacco production within Bojonegoro Regency compared to other subdistricts. Kedungsumber Village, Temayang District, was selected considering that tobacco farming is conducted on the receded land of Pacal Reservoir and that tobacco is widely cultivated in the area.

2.2 Research Data and Sample

Primary data obtained through questionnaires and interviews with farmers and Virginia tobacco marketing institutions were used in this study. The total sample consisted of 58 respondents, including 53 farmers and 5 Virginia tobacco marketing institutions. Farmer respondents were selected using a purposive sampling technique, with the consideration that farmers had planted Virginia tobacco in the previous planting season. Furthermore, marketing institution respondents were determined using a snowball sampling technique, where the initial sample was taken from farmers, followed by sampling marketing institutions, and so on until the product reached consumers

2.3 Data Analysis

Data analysis in this study employed a quantitative descriptive approach. A total of three types of data analysis were used to address the research objectives. The following outlines the stages of the analysis.

a) Analysis of Virginia Tobacco Commodity Marketing Channels

This approach aims to map the distribution pathways of Virginia tobacco commodities from producers to end consumers or processing industries. The analysis includes the identification of actors involved, the relationships among them, the number of distribution stages, as well as the patterns of product and information flow along the marketing channels.

b) Analysis of Marketing Channel Efficiency of Virginia Tobacco Commodities

Marketing channel efficiency was analyzed by considering four main indicators, namely:

1. Marketing Margin, which calculates the difference between the price paid by the final consumer and the price received by farmers. The formula used is:

$$M = Pr - Pf$$

Description:

M : Marketing margin

Pr : Price at the consumer level

Pf : Price at the producer/farmer level

2. Margin Distribution, which identifies the amount of margin received by each marketing actor along the distribution chain. The calculation is based on the proportion of each actor's margin relative to the total marketing margin.
3. Farmers' Share, measures the percentage of the price received by farmers relative to the price paid by the final consumer. The formula used is:

$$Fs = \frac{Pf}{Pr} \times 100\%$$

Description:

FS : *Farmer's Share*

Pf : Price at the producer/farmer level (Rp/Kg)

Pr : Price at the consumer level (Rp/Kg)

4. Marketing Channel Efficiency is assessed based on the comparison between marketing costs and the selling price at the consumer level, while also considering the marketing margin and farmers' share [5]. A marketing channel is considered efficient if marketing costs are relatively low, farmers' share is high, and the marketing margin is at a reasonable level according to the contribution of each actor.

c) Analysis of Price Transmission Elasticity of Virginia Tobacco Commodities

Price transmission elasticity analysis is used to measure the extent to which price changes at the consumer level are transmitted to farmers or vice versa. This approach refers to a simple regression model with the following equation:

$$Et = b \times \frac{\overline{Pf}}{\overline{Pr}}$$

$$b = \frac{\frac{(Pf \cdot Pr) - (\sum Pr)(\sum Pf)}{N}}{(\sum Pf^2) - \frac{(\sum Pf)^2}{N}}$$

Description:

Et : Price transmission elasticity

b : Coefficient

Pf : Price at the producer/farmer level

Pr : Price at the consumer level

$\overline{Pf}$: Average price at the producer/farmer level

$\overline{Pr}$: Average price at the consumer level

N : Number of data points

Criteria for measuring price transmission elasticity analysis:

Et =1, indicates that the rate of price change at the farmer level is equal to the rate of price change at the final trader level.

Et <1, indicates that the rate of price change at the final trader level is smaller than the rate of price change at the farmer level.

Et >1, indicates that the rate of price change at the final trader level is greater than the rate of price change at the farmer level.

3 Results and discussion

3.1 Respondent Characteristics

The characteristics of respondents in this study include farmers and Virginia tobacco marketing institutions in Bojonegoro, Indonesia. The presented data cover the distribution of age, education level, experience, and land area, providing an initial overview of the conditions of actors involved in the production and marketing of this commodity at the research site. The distribution of respondent characteristics in this study is presented in detail in Table 1.

Table 1. Distribution of Respondent Characteristics

Farmer Respondents			Marketing Institution Respondents		
Category	Number	Percentage (%)	Category	Number	Percentage (%)
Age			Age		
40 - 45	2	3.77	40 - 45	3	60
46 - 50	5	9.43	46 - 50	1	20
51 - 55	9	16.98	51 - 55	1	20
56 - 60	16	30.19	56 - 60	0	0
61 - 65	13	24.53	61 - 65	0	0
> 65	8	15.09	> 65	0	0
Total	53	100	Total	5	100
Education			Education		
Unschoolled	1	1.89	Unschoolled	0	0
Elementary School	36	67.92	Elementary School	3	60
Junior High School	10	18.87	Junior High School	2	40
Senior High School	6	11.32	Senior High School	0	0
Total	53	100	Total	5	100
Farming Experience			Trading Experience		
10 - 20	12	22.64	10 - 20	0	0
21 - 30	28	52.83	21 - 30	1	20
31 - 40	7	13.21	31 - 40	2	40
> 40	6	11.32	> 40	2	40
Total	53	100	Total	5	100
Land Area					
≤ 0.25	18	33.96			
0.26 – 0.5	27	50.94			
0.51 – 0.75	5	9.43			
0.76 - 1	3	5.66			
Total	53	100			

Source: Processed Primary Data, 2025

The characteristics of respondents indicate that the majority of Virginia tobacco farmers are within the age range of 56–60 years (30.19%), while the age group with the lowest percentage is the age range of 40-45 years (3.77%), which is likely due to the low interest of

the younger generation in farming for various reasons. In terms of education, most farmers only completed elementary school (67.92%), reflecting limited access to or opportunities for formal education in the past, while the highest education level (senior high school) reached only 11.32%. Farming experience is dominated by farmers with more than 20 years of work (52.83%), indicating well-developed skills and knowledge, although they are still constrained by limited land area, with the majority ranging between 0–0.5 ha (84.9%). Meanwhile, marketing institutions are dominated by actors aged 40–50 years (60%), reflecting a relatively younger workforce compared to farmers, with the majority having completed elementary school (60% each), and and all have more than 20 years of trading experience (100% each). These differences indicate that farmers excel in cultivation experience but are limited in education and land capacity, whereas marketing institutions have a younger workforce with slightly better educational backgrounds, potentially making them more adaptive to market dynamics.

3.2 Analysis of Virginia Tobacco Marketing Channels

The final consumers in this study are tobacco warehouses. The marketing channel models of Virginia tobacco in Bojonegoro, Indonesia were identified. Marketing Channel 1 is more frequently used by Virginia tobacco farmers, with 37 respondents (69.81%), while Marketing Channel 2 is used by 16 respondents (30.19%). Marketing Channel 1 is more efficient than Channel 2 because it involves only one marketing institution. This aligns, who stated that a marketing channel is considered efficient if the channel is shorter. An illustration of the Virginia tobacco marketing channels is presented in Figure 1.

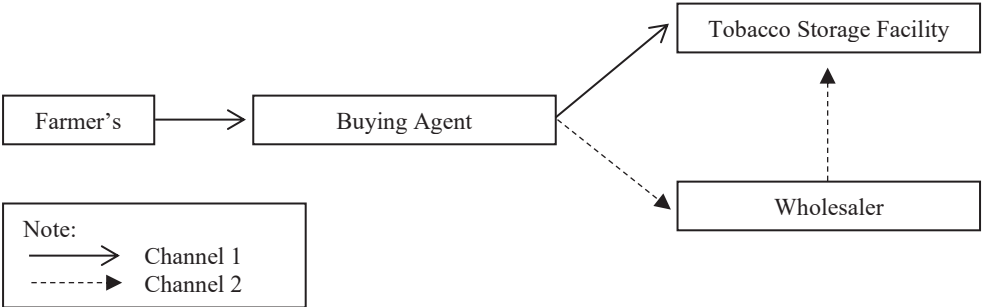


Fig. 1. Virginia Tobacco Marketing Channels in Bojonegoro, Indonesia
Source: Processed Primary Data, 2025

3.3 Analysis of Marketing Channel Efficiency

3.3.1 Marketing Margin and Margin Distribution

The analysis of marketing margin and margin distribution of Virginia tobacco in Bojonegoro, Indonesia aims to examine the allocation of added value between farmers and marketing institutions in Marketing Channels 1 and 2. The comparison of these two channels provides an overview of differences in profit sharing structure, cost efficiency, and their implications for farmers’ bargaining position and welfare. A complete analysis of marketing margin and marg

Table 2. Marketing Margin and Margin Distribution of Marketing Channel 1

No	Marketing Institution and Margin Components	Cost and Price (Rp/Kg)	Margin Distribution (%)	Share (%)
1	Farmer			
	Packaging	100	2.63	0.26
	Transportation	200	5.26	0.52
	Selling Price	34500		
	Profit	34200		89.30
2	Buying Agent			
	Packaging	34	0.89	0.09
	Shrinkage	25	0.66	0.07
	Loading and Unloading	200	5.26	0.52
	Transportation	100	2.63	0.26
	Purchase Price	34500		
	Selling Price	38300		
	Profit	3441		8.98
Margin Value		3800		

Source : Processed Primary Data, 2025

Table 2 shows that the marketing margin and margin distribution in Marketing Channel 1 of Virginia tobacco in Bojonegoro, Indonesia indicate that the profit share is dominated by farmers. The selling price received by farmers reaches IDR 34,500/kg with a margin distribution of 89.30% and a net profit of IDR 34,200/kg. Marketing costs borne by farmers are relatively low, limited to packaging (2.63%) and transportation (5.26%). This condition indicates that most of the selling value directly becomes farmers' income, thereby strengthening their bargaining position in the marketing chain [11]. The dominance of the margin at the farmer level also signifies that this marketing model has a high level of efficiency, as the greatest added value remains with the producers.

The buying agent purchases tobacco at IDR 34,500/kg and resells it at IDR 38,300/kg, generating a margin of IDR 3,800/kg. Most of this margin is absorbed by operational costs, particularly loading and unloading (5.26%) and transportation (2.63%), while packaging (0.89%) and shrinkage (0.66%) costs are relatively low. The collector trader's net profit is recorded at IDR 3,441/kg or 8.98% of the total margin, which is much lower than that of farmers. This structure indicates that buying agent operate with thin margins, making them vulnerable to price fluctuations and increases in operational costs[12].

This margin distribution pattern has two important implications. First, farmers' competitiveness increases because the high profit share allows for investment in quality improvement, cultivation technology, and post-harvest management. Second, the sustainability of the supply chain could be disrupted if collector traders do not earn an adequate margin. Thin margins may reduce their incentive to participate, potentially hindering the distribution from farmers to the final market. Institutional strengthening and cost efficiency strategies at the collector trader level, such as shared transportation, improved loading and unloading systems, and reduction of shrinkage, are relevant measures to maintain the sustainability of this marketing channel.

Table 3. Marketing Margin and Margin Distribution of Marketing Channel 2

No	Marketing Institution and Margin Components	Cost and Price (Rp/Kg)	Margin Distribution (%)	Share (%)
1	Farmer			
	Packaging	100	3.45	0.27
	Transportation	200	6.90	0.53
	Selling Price	34500		
	Profit	34200		89.30
2	Buying Agent			
	Packaging	24	0.83	0.06
	Shrinkage	18	0.62	0.05
	Loading and Unloading	180	6.21	0.48
	Transportation	140	4.83	0.37
	Purchase Price	34500		
	Selling Price	36000		
	Profit	1138		3.04
3	Wholesaler			
	Packaging	48	1.66	0.13
	Shrinkage	30	1.03	0.08
	Loading and Unloading	200	6.90	0.53
	Transportation	100	3.45	0.27
	Purchase Price	36000		
	Selling Price	37400		
	Profit	1022		2.73
Margin Value		2900		

Source : Processed Primary Data, 2025

Table 3 shows that the margin structure in Marketing Channel 2 exhibits a significant dominance of profit at the farmer level, amounting to IDR 34,200/kg or 91.44% of the total margin. This condition reflects the strong bargaining position of farmers, as they are able to sell their harvest at high prices relative to the costs incurred. Upstream costs are relatively low, with packaging contributing IDR 100/kg (3.45%) and transportation IDR 200/kg (6.90%). Operational efficiency at the farmer level remains maintained, so that most of the sales value directly contributes to increasing their income.

At the buying agent level, the total margin obtained reaches IDR 1,138/kg or 3.04% of the total margin. The largest cost share is in the loading and unloading component at IDR 180/kg (6.21%) and transportation at IDR 140/kg (4.83%). This margin is relatively low compared to that of farmers, indicating that the role of buying agent is more focused on the distribution function rather than capturing a large portion of added value [12]. Operational costs at this stage are a determining factor that can influence prices in the subsequent distribution chain.

The wholesaler obtains a margin of IDR 1,022/kg or 2.73% of the total margin, with the largest costs coming from loading and unloading at IDR 200/kg (6.90%) and transportation at IDR 100/kg (3.45%). The low margin obtained may reflect price pressures in the final market or the nature of the commodity, which quickly changes hands without undergoing additional processing [13].

Overall, the total margin in Channel 2 reaches IDR 2,900/kg, with a distribution highly favorable to farmers. This condition has a positive impact on farmers' welfare, but it may pose challenges for downstream actors, as thin margins can reduce their incentive to maintain

the distribution network. Improving logistics efficiency, refining profit-sharing mechanisms, and strengthening partnerships among value chain actors are strategic measures to ensure the sustainability of this marketing channel.

The comparative analysis results show a significant difference between the two Virginia tobacco marketing channels. Channel 1 records a total margin of IDR 3,800/kg, higher than Channel 2 at IDR 2,900/kg. The margin distribution in Marketing Channel 1 shows an imbalance, where collectors control 54.47% while Virginia tobacco farmers receive only 45.53%, due to the strategic position of the traders, transaction scale, and limited farmer access to the final market. This distribution pattern indicates downstream profit dominance and a weak bargaining position for farmers, although the channel remains attractive to wholesalers as it provides high-profit incentives. This condition suppresses farmers’ income, increases traders’ profits, has the potential to create socio-economic disparities, and underscores the need for policies empowering farmers through direct market access, business training, and distribution chain oversight.

The margin distribution in Marketing Channel 2 shows that wholesalers receive the largest share at 36.35%, followed by collectors at 34.81% and farmers at 28.85%, reflecting the dominant role of wholesalers in the supply chain. This situation impacts farmers’ relatively lower income, increases their dependence on intermediaries, and highlights the need for strategies to empower farmers through direct market access, business training, and distribution oversight to achieve a fairer margin distribution.

Marketing Channel 2 is considered better because the proportion of the margin received by farmers is higher relative to the total margin available in the supply chain, thereby reducing their dependence on a single intermediary and increasing the opportunity for fairer income. However, wholesalers remain the dominant actors, so strategies to empower farmers must still be prioritized to optimize their profits. The margin distribution concentrated upstream, low distribution costs, and higher net selling prices make this channel more supportive of farmers’ welfare improvement. From the perspective of increasing farmers’ income, Channel 2 can be considered superior. However, from the supply chain sustainability perspective, which requires sufficient involvement and incentives for wholesalers, Channel 1 has greater potential attractiveness.

4 Farmer’s Share

The analysis of the farmer’s share for Virginia tobacco was conducted by comparing the proportion of the price received by farmers in Marketing Channels 1 and 2., in order to assess marketing efficiency and its implications for farmers’ income and bargaining position. The complete results of the farmers’ share values are presented in Table 4 below.

Table 4. Farmers’ Share Values

Marketing Channel	Farmer Price (Rp/Kg)	Final Trader Price (Rp/Kg)	Farmer’s Share (%)
Channel 1	34500	38300	90.08
Channel 2	34500	37400	92.25

Source: Processed Primary Data, 2025

Table 4 shows that the farmers’ share percentage of Virginia tobacco in Marketing Channels 1 and 2 exceeds 90%. This indicates that farmers receive a very large portion of the revenue from the prices paid by final consumers [12]. The figure suggests that the marketing chain is relatively efficient, with marketing costs and margins taken by intermediary institutions being relatively small [12]. This condition has positive effects, such as strengthening farmers’ bargaining position, increasing motivation to maintain and develop

tobacco cultivation, and promoting the sustainability of farming activities in the area [13]. Nevertheless, efforts are needed to maintain distribution efficiency and expand market access so that this proportion can be preserved or even increased in subsequent seasons.

5 Marketing Channel Efficiency

The analysis of the marketing channel efficiency of Virginia tobacco in Bojonegoro, Indonesia was conducted on two distribution routes involving farmers and marketing institutions. This comparison aims to identify differences in cost structure and distribution chains, as well as their implications for the price share received by farmers, thereby providing a basis for determining more optimal and competitive marketing strategies. The complete results of marketing efficiency values are presented in Table 5 below.

Table 5. Marketing Efficiency Values

Description	Value (Rp/Kg)	
	Channel 1	Channel 2
Total Marketing Costs	659	1040
Purchase Price	34500	36000
Marketing Efficiency Value (%)	1.91	2,89

Source: Processed Primary Data, 2025

Table 5 shows that the marketing of Virginia tobacco in Bojonegoro, Indonesia is considered efficient, as indicated by the marketing efficiency (Eps) values being below 5%. The Eps value in Channel 1 is recorded at 1.91%, while in Channel 2 it is 2.89%. These findings stated that marketing channels with Eps values below 5% are categorized as efficient. Channel 1 is considered more efficient due to its shorter marketing chain, involving only collector traders, whereas Channel 2 includes two marketing institutions, namely collector traders and wholesalers. This is consistent that the shorter the product distribution chain, the higher the marketing efficiency [5].

5.1 Price Transmission Elasticity Analysis

The results of the study indicate that the price transmission elasticity (Et) of Virginia tobacco in Bojonegoro, Indonesia is 10.62, which is absolutely greater than 1. This value indicates that changes in prices at the end-market level are transmitted to farmers’ prices at a greater proportion, making the prices received by farmers highly responsive to market fluctuations. These findings are stated that a price transmission elasticity value greater than one indicates an elastic market that tends to be oligopsonistic, where the limited number of buyers has the ability to influence purchase prices at the producer level [14, 5]. The implications of these findings underscore the need for marketing strategy interventions and the strengthening of farmers’ bargaining position through the formation of more equitable institutions or partnerships, thereby reducing price transmission distortions and enhancing farmers’ welfare.

Economically, this condition suggests that the demand for Virginia tobacco at the farmer level is elastic, so a decrease in market prices can lead to a significant reduction in the purchase price received by farmers, and vice versa. This phenomenon also reflects an oligopsonistic market structure, where only a few dominant traders or buyers influence purchase prices. As a result, farmers’ bargaining power is relatively limited, and they tend to be more vulnerable to price changes determined by dominant buyers. The implications of these findings include the need for strategies to empower farmers, such as increasing access

to alternative markets, establishing cooperatives or direct sales networks, and implementing policies that support price transparency, so that profit distribution becomes fairer and farmers' dependence on a few buyers can be minimized.

6 Conclusions

The research findings indicate that the marketing channels for Virginia tobacco in the form of dried leaves or shreds in Bojonegoro Regency consist of two channels: (1) farmers → collectors → tobacco warehouses, and (2) farmers → collectors → wholesalers → tobacco warehouses. Marketing efficiency analysis based on marketing margin, margin distribution, and farmer's share shows that Marketing Channel 1 is more efficient, with a margin of IDR 3,800, compared to Marketing Channel 2, which has a margin of IDR 2,900. The price transmission elasticity value of 10.62 that changes in prices at the end-market level are transmitted to farmers' prices at a greater proportion, making the prices received by farmers highly responsive to market fluctuations. Based on these findings, Virginia tobacco farmers in Bojonegoro, Indonesia are advised to establish strategic partnerships with cigarette companies or tobacco processing industries to secure price certainty and reduce dependence on intermediaries that may suppress profits. In addition, strengthening farmer institutions and optimizing supply chain management are necessary to enhance farmers' bargaining position, ensure fairer margin distribution, and maintain the sustainability of tobacco farming in the region.

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