



Comparative and Competitive Analysis of Crossbreed Indigenous Chicken Varieties in East Java, Indonesia

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Abstract. This research aimed to evaluate the competitiveness of crossbreed indigenous chicken commodities in Malang Regency by examining both competitive and comparative advantages through private and social price analysis. The survey method gathered data from selected farmers, analyzed using the Policy Analysis Matrix (PAM) methodology. Results revealed that Native Javanese indigenous chicken generated private profit (PP) of 7,734.31 IDR/bird and social profit (SP) of 9,094.57 IDR/bird, while Super Javanese indigenous chicken yielded PP of 9,707.44 IDR/bird and SP of 10,937.05 IDR/bird. Competitiveness analysis showed favorable Private Cost Ratio values of 0.44 and 0.35, with Domestic Resource Cost Ratio values of 0.40 and 0.33 for Native and Super Javanese varieties, respectively. These findings confirm both chicken types maintain competitive advantage, with Super Javanese demonstrating superior efficiency. To enhance sector performance, producers should focus on improved breeding practices, optimized feed formulation, and participation in extension programs to increase both quality and production volume.

Keywords: Competitiveness analysis; Crossbreed Indigenous chicken; policy analysis matrix (PAM).

1 Introduction

The rate of population growth in Indonesia continues to increase year by year, accompanied by rising income levels, educational attainment, and shifting consumption patterns toward higher-quality, nutritious food products [1]. This demographic and economic evolution has intensified demand for animal protein sources, particularly poultry products. However, domestic production has not kept pace with this growing demand, creating opportunities for developing promising local commodities such as indigenous chickens.

Indigenous chickens occupy a significant position in Indonesia's agricultural landscape, serving multiple functions beyond mere protein provision. According to Nataamijaya [2], these chickens function as sources of high-quality protein, household savings, and domesticated animals with cultural significance. Furthermore, they represent valuable genetic resources for breeding programs aimed at enhancing poultry production [3]. Indigenous chickens also maintain cultural importance, featuring prominently in traditional ceremonies across Indonesia's diverse regions [4].

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Competitiveness in agricultural systems refers to producers' capacity to create high-quality products at reasonable costs while maintaining profitable operations [5]. This concept encompasses the balance between product quality and cost efficiency that enables producers to remain viable in competitive markets [6]. According to Daryanto [7], commodities demonstrate comparative advantage when they achieve economic efficiency. Pearson et al. [8] established that Revealed Competitive Advantages (RCA) provide a framework for assessing competitiveness under current market conditions. While comparative advantages relate to economic feasibility, competitive advantages focus on financial viability [9]. Together, these concepts form a comprehensive analytical framework for evaluating agricultural enterprises.

Malang Regency represents a significant production zone for indigenous chickens in East Java Province. Data from the Department of Animal Husbandry East Java Province [10] indicates indigenous chicken production in Malang reached approximately 2,856,992 kg in 2016, a substantial volume compared to other regions. Simatupang and Hadi [11] observed that Indonesian livestock products increasingly face competition from imported alternatives, particularly in meat and dairy sectors. To maintain market position, Indonesian farmers must enhance competitiveness against similar products [12]. Therefore, research identifying competitive and comparative advantages of livestock commodities provides essential insights for producers seeking to strengthen market position.

This study aims to evaluate the competitiveness of crossbreed indigenous chicken commodities in Malang Regency by analyzing their competitive and comparative advantages through examination of private and social prices. These findings can guide producers toward improving product quality, production efficiency, and market positioning.

2 Materials and Methods

2.1 Research Location and Data Collection

This study was conducted in Malang Regency, East Java Province, Indonesia. Data collection incorporated both primary and secondary sources. Primary data encompassed production volumes, costs, and revenues obtained through direct observation, structured interviews, and documentation from indigenous chicken farmers. Secondary data included price comparisons and contextual information from relevant agricultural publications and institutional sources.

The research employed a survey method with qualitative descriptive analysis using the Policy Analysis Matrix (PAM) framework developed by Pearson et al. [8]. Respondents were selected through purposive sampling, comprising six farmers who managed populations of 500-3,000 birds of either Native Javanese or Super Javanese indigenous chicken varieties. While this sample size is limited; it reflects the current regional reality where only a small number of farmers (approximately 5% in the study area) maintain indigenous chicken populations exceeding 500 birds with systematic record-

keeping practices. The selection criteria prioritized: (1) farmers with established operations of at least two years, (2) those maintaining comprehensive production records essential for PAM analysis, and (3) farmers representing diverse market access conditions (two with direct retail access, two with middleman arrangements, and two with institutional contracts). This sampling approach ensured data quality and reliability while capturing the operational diversity within the emerging commercial indigenous chicken farming sector in the region. The findings, while not statistically generalizable to all farming contexts, provide valuable insights into the economic dynamics of this specific farming system.

2.2 Analytical Framework

The analytical framework centered on the Policy Analysis Matrix, which systematically evaluates agricultural commodity competitiveness by examining revenues, costs, and profits at both private and social prices. Table 1 presents the basic PAM structure employed in this analysis.

Table 1. Policy Analysis Matrix (PAM).

Description	Cost			
	Revenue	Input Tradeable	Factor Domestic	Profit
Private Price	A	B	C	D
Social Price	E	F	G	H
Divergence	I	J	K	L

Source: Pearson et al. [13].

From this matrix structure, analytical indicators were calculated to assess competitiveness and policy impacts. Private Profit (D) equals $A - B - C$, while Social Profit (H) equals $E - F - G$. Transfer Output (I) is calculated as $A - E$, with Input Transfer (J) as $B - F$, Factor Transfer (K) as $C - G$, and Net Transfer (L) as $D - H$ or $I - J - K$. Competitive advantages are evaluated through Private Cost Ratio ($PCR = C / (A - B)$), while comparative advantages are examined via Domestic Resource Cost Ratio ($DRCR = G / (E - F)$). Additional indicators include Nominal Protection Coefficient Output ($NPCO = A / E$), Nominal Protection Coefficient Input ($NPCI = B / F$), Profit Coefficient ($PC = D / H$), Effective Protection Coefficient ($EPC = (A - B) / (E - F)$), and Subsidy Ratio to Producer ($SRP = L / E$).

These indicators collectively provide comprehensive assessment of competitiveness factors, policy influences, and economic efficiency in indigenous chicken production systems.

3 Results and Discussion

3.1 Profile of Chicken Types

This research examined two distinct crossbreed indigenous chicken varieties prevalent in Malang Regency. The Native Javanese indigenous chicken resulted from crossing pure Bangkok roosters with indigenous hen varieties, developed by a local breeder in Tlogo Mas, Malang. This variety demonstrates consistent performance characteristics including accelerated growth compared to traditional indigenous breeds, reduced mortality rates, improved feed conversion efficiency, environmental adaptability, traditional flavor profiles, and market-ready maturity at 55-60 days.

The Super Javanese indigenous chicken represents a cross between local chickens and layer-type breeds [14]. This variety exhibits superior growth rates compared to purely local chickens [15], while maintaining physical appearance similar to traditional indigenous varieties. Farmers typically find Super Javanese more profitable due to shorter production cycles and enhanced productivity [16]. These characteristics enable more efficient resource utilization and faster capital turnover, contributing to improved economic returns.

3.2 Profitability Analysis (Revenue, Cost, and R/C)

Table 2 presents the economic performance of indigenous chicken production on a per-bird basis. Both varieties generate positive financial returns, with Super Javanese demonstrating superior profitability despite identical revenue streams.

Table 2. Revenue of Indigenous Chicken Commodity.

No.	Information	Type of Indigenous Chicken	
		Native Javanese Total (IDR)/Bird	Super Javanese Total (IDR)/Bird
1.	Revenue		
	Life Body Weight of Indigenous Chicken (kg)	28.000	28.000
	Chicken Manure (kg)	5.000	5.000
	Sack	23	23
	Total	33.023	33.023
2.	Production Cost	25.327	23.315
3.	Profit (1-2)	7.695	9.707
4.	R/C	1.30	1.42

*) Live Weight/Bird = 0.8 kg, *) Period = 60 Days.

The revenue analysis reveals R/C ratios exceeding 1.0 for both varieties (1.30 for Native Javanese and 1.42 for Super Javanese), confirming that these production systems generate positive economic returns. These findings align with research by Dewanti and Sihombing [17], which similarly demonstrated economic viability of indigenous chicken farming. Revenue components included sales of mature birds, manure utilized as organic fertilizer, and packaging materials. Production costs encompassed feed, day-old chicks, labor, housing, equipment, and veterinary expenses, with feed representing the largest expenditure category.

3.3 Competitiveness Assessment (PAM: PP, SP, DRCR, PCR)

The Policy Analysis Matrix approach enables systematic evaluation of competitiveness based on comprehensive assessment of revenues, costs, and profits divided into private and social valuations [18]. Tables 3 and 4 present the PAM analysis results for both indigenous chicken varieties.

Table 3. Policy Analysis Matrix (PAM) of Indigenous Chicken.

Information	Revenue	Cost		Profit
		Tradeable Input	Non-Tradeable Input	
Native Javanese Indigenous Chicken				
Private	33,022.67	19,316.19	5,972.16	7,734.31
Social	33,022.67	17,955.94	5,972.16	9,094.57
Divergence	0	1,360.26	0	-1,360.26
Super Javanese Indigenous Chicken				
Private	33,022.67	18,009.73	5,305.49	9,707.44
Social	33,022.67	16,780.12	5,305.49	10,937.05
Divergence	0	1,229.61	0	-1,229.61

*) Live Weight/Bird = 0.8 kg, *) Period = 60 Days.

The PAM analysis reveals both production systems demonstrate strong competitive and comparative advantages. Private Profitability values of 7,734.31 IDR/bird for Native Javanese and 9,707.44 IDR/bird for Super Javanese confirm financial viability under existing market conditions. The Private Cost Ratio values of 0.44 and 0.35 for Native and Super Javanese varieties, respectively, indicate substantial competitive advantage, as these values fall significantly below the critical threshold of 1.0. The lower PCR for Super Javanese signifies superior efficiency in utilizing domestic resources to generate value added at private prices.

Similarly, Social Profitability values of 9,094.57 IDR/bird for Native Javanese and 10,937.05 IDR/bird for Super Javanese demonstrate economic efficiency when evaluated at social opportunity costs. The Domestic Resource Cost Ratio values of 0.40

and 0.33 for Native and Super Javanese varieties, respectively, confirm strong comparative advantage, as these values remain well below 1.0. The superior DRCR for Super Javanese indicates more efficient allocation of domestic resources from an economic perspective, reflecting inherent biological advantages including faster growth rates, improved feed conversion efficiency, and shorter production cycles.

Table 4. Policy Analysis Matrix (PAM) Indicator.

Indicators	Value	
	Native Javanese Type	Super Javanese Type
Private Profitability (PP)	7,734.31	9,707.44
Private Cost Ratio (PCR)	0.44	0.35
Social Profitability (SP)	9,094.57	10,937.05
Domestic Resource Cost Ratio (DRCR)	0.40	0.33
Transfer Input (TI)	1,360.26	1,229.61
Nominal Protection Coefficient on Tradable Input (NPCI)	1.08	1.07
Factor Transfer (FT)	0	0
Transfer Output (TO)	0	0
Nominal Protection Coefficient on Tradable Output (NPCO)	1	1
Effective Protection Coefficient (EPC)	0.91	0.92
Profitability Coefficient (PC)	0.85	0.89
Net Transfer (NT)	-1,360.26	-1,229.61
Subsidy Ratio to Product (SRP)	-0.04	-0.04

*) Live Weight/Bird = 0.8 kg, *) Period = 60 Days.

The comparative advantage of Super Javanese can be attributed to its genetic composition that combines desirable local characteristics with enhanced productivity traits from layer-type breeds, resulting in more efficient biological performance while maintaining consumer-preferred characteristics such as meat flavor and texture. These production efficiencies translate directly into improved financial returns despite similar market prices for both varieties.

3.4 Policy Impact Analysis (EPC, NT, SRP, TI/TO)

Agricultural policy interventions significantly influence production systems through various market and regulatory mechanisms that affect input costs, output prices, and overall producer incentives. The Policy Analysis Matrix methodology enables systematic assessment of these policy impacts by calculating divergences between private and social valuations, thereby quantifying the extent and direction of policy effects on agricultural competitiveness. For indigenous chicken production in Malang Regency, several key policy impact indicators merit examination, including Transfer Output (TO),

Transfer Input (TI), Effective Protection Coefficient (EPC), Net Transfer (NT), and Subsidy Ratio to Producer (SRP). These indicators collectively reveal whether current policy environments enhance or constrain sector development, with particular relevance for understanding how government taxation policies affect production costs and profitability in the indigenous chicken subsector. Table 4 presents the calculated policy impact indicators for both Native and Super Javanese indigenous chicken varieties, providing empirical evidence of policy effects on these production systems.

Government policies enacted in 2009 include Value Added Tax (VAT) of 10% applied to production inputs including feed, vitamins, and medicines for indigenous chickens under Constitution No.42 of 2009, Article 7. The PAM analysis reveals several policy effects on indigenous chicken production systems.

Transfer Input values of 1,360.26 IDR and 1,229.61 IDR for Native and Super Javanese varieties, respectively, indicate that producers pay more for tradable inputs than their economic value would suggest. This finding is reinforced by Nominal Protection Coefficient Input values exceeding 1.0 (1.08 and 1.07 for Native and Super Javanese, respectively), demonstrating approximately 7-8% taxation effect on input costs.

The Effective Protection Coefficient values of 0.91 for Native Javanese and 0.92 for Super Javanese (both below 1.0) suggest that government policies fail to effectively protect domestic producers and may actually disadvantage them through input taxation without corresponding output price support. This assessment is confirmed by negative Net Transfer values (-1,360.26 IDR and -1,229.61 IDR) and negative Subsidy Ratio to Producer values (-0.04 for both varieties), indicating implicit taxation rather than subsidization of production.

Despite these policy-induced disadvantages, both indigenous chicken production systems maintain strong competitive and comparative advantages, demonstrating the inherent efficiency of these production systems even without supportive policy environments. However, policy reforms reducing input taxation could further enhance competitiveness and encourage expanded production.

4 Conclusion

In conclusion, the PAM analysis demonstrates that crossbreed indigenous chicken commodities in Malang Regency possess significant competitive and comparative advantages. This is evidenced by favorable PCR values of 0.44 and 0.35, and DRCR values of 0.40 and 0.33 for Native and Super Javanese varieties, respectively. Both production systems generate positive economic returns, with Super Javanese demonstrating superior efficiency and profitability due to enhanced biological performance including faster growth rates, improved feed conversion, and shorter production cycles.

Current government policies, particularly input taxation without offsetting output price support, create moderate disadvantages for producers through increased production costs. However, the inherent efficiency of these production systems enables them to maintain strong competitiveness despite these policy-induced challenges. Further development of the indigenous chicken sector would benefit from policy reforms reducing input taxation, enhanced extension services facilitating knowledge transfer of improved

management practices, and marketing initiatives promoting the distinctive qualities of indigenous chicken products.

Indigenous chicken producers should focus on improving both product quality and production quantity through enhanced breeding programs, optimized nutrition, improved health management, and participation in knowledge-sharing networks. These efforts would further strengthen the already substantial competitiveness of this promising agricultural subsector, contributing to rural economic development and improved food security.

Disclosure of Interests. The authors have no competing interests to declare that are relevant to the content of this article.

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