

Analysis of Factors Affecting Consumer Satisfaction and Loyalty Toward Bulog Rice in Mojokerto Regency

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ABSTRACT

This study aims to analyze the influence of product quality, price, agent service, sales location, and brand image on consumer satisfaction and loyalty toward BULOG rice in Mojokerto. Using a quantitative approach with 100 respondents selected through purposive sampling, data were analyzed using Partial Least Squares-Structural Equation Modeling (PLS-SEM) in SmartPLS. The results indicate that while product quality, agent service, and sales location significantly influence satisfaction, they function as "hygiene factors" with small effect sizes. A notable "price disconnect" was identified: affordability strongly drives satisfaction ($p=0.007$) but fails to significantly foster loyalty ($p=0.265$). Conversely, brand image does not influence satisfaction ($p=0.845$) but acts as a "security anchor" that directly sustains loyalty ($p=0.014$) through institutional trust. Predictive relevance was confirmed using the PLSpredict procedure, showing robust Q2 values of 0.497 for satisfaction and 0.620 for loyalty. These findings suggest that BULOG should pivot from general marketing to operational excellence, focusing on quality SOPs and standardized agent services to transform institutional credibility into lasting consumer commitment.

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1. Introduction

Mojokerto Regency has significant potential in the agricultural sector, particularly in rice production, which continues to increase through the use of productive paddy fields. The majority of its population works as farmers who depend on agricultural yields for their livelihoods. In addition to meeting household consumption needs, harvested crops are sold to improve farmers' welfare. Agricultural productivity is influenced by income levels and the size of cultivated land; larger cultivated areas result in higher productivity. The Mojokerto Regency is one of the major rice-producing regions in East Java Province, supported by extensive and productive paddy fields that continue to sustain regional agricultural output. A large proportion of the population relies on agriculture as its primary source of livelihood, where rice cultivation serves not only household consumption needs but also as a key driver of rural income and welfare. Agricultural productivity in this region is closely associated with income levels and land size, as larger cultivated areas tend to generate higher yields and economic returns (Asnita *et al.*, 2023). Within the national food security framework, Mojokerto therefore occupies a strategic position as a rice granary, contributing significantly to regional and national rice availability.

Within this agricultural ecosystem, Perum BULOG plays a central role as a government agency mandated to maintain rice price stability and ensure food security. Its core responsibilities include managing government rice reserves, procuring rice from local farmers, and distributing affordable, high-quality rice to the public (Kurnia *et al.*, 2020). At the regional level, the BULOG Mojokerto Branch functions as a key operational unit in translating these mandates into practice, particularly through retail distribution channels such as Rumah Pangan Kita (RPK). The RPK program is designed to shorten distribution chains, stabilize prices, and improve community access to staple food products, especially for low- and middle-income households.

Despite its strategic role, BULOG continues to face substantive challenges in sustaining consumer interest and loyalty toward its rice products. Internal reports from the BULOG Mojokerto Branch indicate that BULOG rice sales through RPK outlets declined by approximately 12–15% between 2022 and 2024, while the market share of premium commercial rice brands in modern and semi-modern retail outlets increased during the same period. Field observations and customer feedback records further reveal recurring complaints related to grain uniformity, aroma, and packaging quality, which together accounted for nearly 30% of total consumer complaints reported at RPK outlets in 2024. Similar quality-related concerns have also been documented in previous studies on BULOG and government-distributed rice, where inconsistencies in physical attributes and packaging were found to influence consumer dissatisfaction and repurchase reluctance (Choerunnisa *et al.*, 2024; Karsiningsih *et al.*, 2024). In addition, distribution limitations persist, as not all sub-districts in Mojokerto Regency are evenly served by active RPK agents, resulting in uneven service quality and accessibility. These conditions reinforce a prevailing perception among some consumers that BULOG rice represents a “secondary choice” compared to commercial brands, despite its relative price advantage. Intensifying competition with premium rice brands in the retail market, therefore, heightens the urgency to understand the determinants of consumer satisfaction and loyalty toward BULOG rice, particularly in rice-producing regions such as Mojokerto Regency, where consumers have abundant alternatives.

From a theoretical perspective, consumer satisfaction and loyalty toward staple food products can be explained through the satisfaction–loyalty framework, which is closely linked to the Expectation Disconfirmation Theory. This theory posits that consumer satisfaction emerges when perceived performance, such as product quality, price fairness, service reliability, and accessibility, meets or exceeds prior (Tjiptono & Chandra, 2019; Kotler & Keller, 2021). In the context of government-managed products like BULOG rice, satisfaction is not solely driven by price affordability but also by perceptions of consistent quality, reliable distribution, service interactions at RPK agents, and the credibility of the BULOG brand. Empirical studies consistently demonstrate that higher satisfaction strengthens repeat purchase behavior and long-term loyalty, including in the context of staple foods and agricultural products (Aprelyani, 2023; Naini *et al.*, 2022). Satisfied consumers are therefore more likely to maintain loyalty, which is essential for stabilizing demand and supporting the broader objectives of food security programs.

Previous studies have extensively examined factors influencing rice purchasing behavior across various market contexts. Sembiring *et al.* (2025) found that income, lifestyle, and price play a dominant role in shaping consumer decisions to purchase premium rice in Malang City, with price emerging as the most influential determinant. Indriani and Imran (2025) emphasized the importance of rice availability, distribution responsiveness, and price

interaction in enhancing supply chain performance, while also noting that technological and economic changes influence farmers' loyalty toward distributors. Similarly, Lestari *et al.* (2024) demonstrated that product quality, price, and place positively affect rice purchasing decisions in traditional market settings such as Cipanas Market in Cianjur Regency. Studies focusing on RPK outlets, including Choerunnisa *et al.* (2024), revealed that consumer behavior in Semarang City is largely shaped by premium rice prices, substitute prices, income, and family size, whereas promotional information is often sought independently by consumers. At the agent level, Setiawan & Safitri (2019) showed that product quality and price positively influence consumer satisfaction, which, in turn, drives repurchase intention.

Although these studies provide important insights, they predominantly focus on commercial rice products or general market environments. As a result, empirical understanding of BULOG rice remains fragmented and limited, particularly given its distinctive characteristics as a government-managed staple food product distributed through public-oriented retail channels such as RPK. More importantly, prior research rarely examines the integrated mechanism through which product quality, price perception, service quality, sales location accessibility, and brand image jointly shape consumer satisfaction and subsequently translate into consumer loyalty. This gap is especially pronounced in major rice-producing regions, where consumers simultaneously interact with government-distributed rice and increasingly competitive commercial brands, creating a complex decision-making environment that existing studies have not adequately captured in existing studies.

Addressing this gap, the present study aims to analyze the factors influencing consumer satisfaction and loyalty toward BULOG rice in Mojokerto Regency by testing an integrated satisfaction–loyalty model. Specifically, this study examines how product quality, price perception, service quality, sales location accessibility, and brand image influence consumer satisfaction, and how satisfaction, in turn, shapes consumer loyalty toward BULOG rice. Based on this framework, it is hypothesized that higher perceived product quality, fair price perception, reliable service quality, accessible sales locations, and a positive brand image enhance consumer satisfaction, thereby strengthening consumer loyalty toward BULOG rice. By situating this analysis within a major rice-producing region, the study seeks to extend consumer satisfaction loyalty literature in the context of government-managed staple food products and provide practical insights for Perum BULOG in improving quality assurance, pricing strategies, brand-building efforts, and distribution effectiveness amid increasingly competitive rice markets.

2. Methodology

2.1 Research Design and Study Site

This study adopted a quantitative explanatory research design using Structural Equation Modeling Partial Least Squares (SEM-PLS) to examine the causal relationships among product quality, price, agent service, sales location, brand image, consumer satisfaction, and consumer loyalty. The explanatory approach is appropriate given the objective of testing theoretically grounded relationships rather than merely describing phenomena (Hair & Risher, 2019).

Administratively, the research was coordinated through the Perum BULOG Mojokerto Branch Office, which was purposively selected due to its strategic role in managing rice distribution in one of East Java's major rice-producing regions. However, the actual data

collection sites were Rumah Pangan Kita (RPK) agents, where BULOG rice transactions directly occur. This distinction clarifies that the BULOG office served as the institutional locus of the study, while RPK outlets functioned as the operational units for respondent recruitment. The research was conducted from February to April 2025.

2.2 Population and Sampling

The population of this study comprises consumers who had purchased or were currently purchasing BULOG rice through RPK agents in Mojokerto Regency. Because the exact population size was unknown and continuously changing, a non-probability convenience sampling technique was employed (locally referred to as accidental sampling). The minimum sample size was determined using the Cochran formula for an unknown population (Arif *et al.*, 2017), resulting in 100 respondents. Although Cochran's formula provides a statistical basis for sample adequacy, the chosen sample size also meets common SEM-PLS requirements, particularly the rule-of-thumb that the sample should be at least ten times the maximum number of structural paths directed at a single latent construct. Given the model structure and the exploratory–predictive nature of SEM-PLS, a sample size of 100 is considered sufficient for reliable parameter estimation and hypothesis testing (Hair & Alamer, 2022; Sofyani, 2025).

2.3 Instrument Development and Measurement

Data were collected using a structured questionnaire designed to measure respondents' perceptions of the study variables. All indicators were adapted from established marketing and consumer behavior literature and measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Importantly, indicators related to physical rice attributes such as grain cleanliness, broken grain percentage, aroma, and texture were explicitly framed as perceived quality attributes, as the data were obtained through consumer self-reports rather than objective laboratory measurements (Hair *et al.*, 2022).

This approach aligns with consumer satisfaction theory, which emphasizes perceived rather than objective performance. Prior to full-scale data collection, the questionnaire underwent expert validation involving academics with expertise in marketing and agribusiness, followed by a pilot test with a limited number of respondents to ensure clarity, relevance, and consistency of items. Feedback from these stages was used to refine wording and indicator alignment before final deployment.

2.4 Variables and Indicators

This study employs seven latent variables derived from established marketing theory: Product Quality (X1), Price (X2), Agent Service (X3), Sales Location (X4), Brand Image (X5), Consumer Satisfaction (Y1), and Consumer Loyalty (Y2). The construct previously labeled "Brand" is conceptually specified as Brand Image, emphasizing consumer perceptions and associations toward BULOG rice rather than switching behavior or price sensitivity. The operational definitions and indicators of each variable are presented in Table 1.

Table 1. Research Variables and Indicators

Variable	Indicator	References
Product Quality (X1)	Rice color (X1.1) Rice cleanliness (X1.2) Broken grain percentage (X1.3) Rice tenderness (X1.4) Durability (X1.5) Aroma (X1.6) Taste (X1.7)	Kotler & Keller (2021); Tjiptono (2019); Naini <i>et al.</i> (2022); Aprelyani (2023)
Price (X2)	Price affordability (X2.1) Price-quality match (X2.2) Attractive discounts/promotions (X2.3)	Kotler & Keller (2021); Tjiptono (2019); Hira <i>et al.</i> (2024); Harisandi & Purwanto (2022)
Agent Service (X3)	Agent friendliness (X3.1) Service speed (X3.2) Ability to provide information (X3.3)	Kotler & Keller (2021); Tjiptono (2019); Naini <i>et al.</i> (2022); Aprelyani (2023); Parasuraman <i>et al.</i> (1988)
Sales Location (X4)	Accessibility of sales location (X4.1) Adequate facilities (X4.2)	Kotler & Keller (2021); Tjiptono (2019); Karsiningsih <i>et al.</i> (2024); Al-Ardi <i>et al.</i> (2024)
Brand Image (X5)	Consumer perception of BULOG rice brand (X5.1) Perceived brand reliability and credibility (X5.2) Perceived quality associated with BULOG brand (X5.3)	Kotler & Keller (2021); Tjiptono (2019); Karsiningsih <i>et al.</i> (2024); Al-Ardi <i>et al.</i> (2024); Keller & Swaminathan (2020); Mabkhot <i>et al.</i> (2017)
Consumer Satisfaction (Y1)	Satisfaction with product quality (Y1.1) Satisfaction with price (Y1.2) Product suitability to expectations (Y1.3)	Kotler & Keller (2021); Tjiptono (2019); Naini <i>et al.</i> (2022); Aprelyani (2023); Oliver (2014); Slack & Singh (2020)
Consumer Loyalty (Y2)	Repurchase intention (Y2.1) Product recommendation (Y2.2) Resistance to switching (Y2.3)	Kotler & Keller (2021); Tjiptono (2019); Naini <i>et al.</i> (2022); Aprelyani (2023); Oliver (2014); Slack & Singh (2020)

2.5 Data Collection and Ethical Considerations

Primary data were collected by directly distributing questionnaires to eligible consumers at RPK outlets. Inclusion criteria required respondents to have purchased BULOG rice at least once. Participation was voluntary, and respondents were informed of the study's purpose, the anonymity of responses, and the confidentiality of their data prior to completing the questionnaire. No personal identifiers were recorded. Secondary data were obtained from BULOG internal reports, official publications, government databases, and relevant academic literature to support contextual analysis.

2.6 Data Analysis Technique

Data analysis was conducted using SEM-PLS with SmartPLS 4. The analysis followed established SEM-PLS reporting standards, consisting of:

1. Outer model evaluation, including indicator loadings, Average Variance Extracted (AVE), Composite Reliability (CR), and discriminant validity using the HTMT criterion.
2. Inner model evaluation, comprising multicollinearity assessment (VIF), coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2).
3. Hypothesis testing, performed through bootstrapping procedures to assess the significance of path coefficients.
4. Mediation analysis, examining the role of consumer satisfaction in linking antecedent variables to consumer loyalty.

This procedure ensures both the reliability of measurement instruments and the robustness of structural relationships prior to interpretation.

2.7 Research Model

The conceptual framework illustrating the relationships among variables is presented in Figure 1.

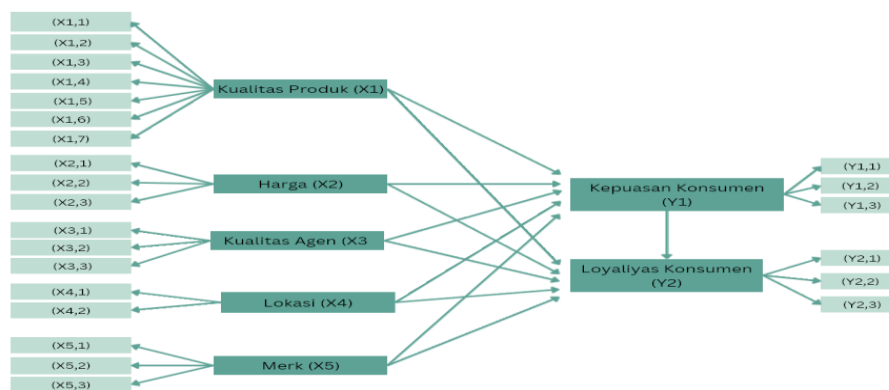


Figure 1. Model Framework

The evaluation of the outer model was conducted through convergent and discriminant validity testing as well as internal consistency reliability to confirm that all constructs were measured appropriately before proceeding to structural model analysis.

3. Results and Discussion

3.1. Measurement Model Evaluation

3.1.1 *Convergent Validity*

Convergent validity assesses the extent to which indicators of a specific construct converge or share a high proportion of variance. This is evaluated using outer loadings and Average Variance Extracted (AVE). According to Hair & Alamer (2022) and Sofyani (2025), an indicator is considered valid if its outer loading is above 0.70.

Table 2. Factor Loading Values

Research Variable	Indicator	Loading Factor	Requirement	Conclusion
Product Quality (X1)	X1.1	0.754	> 0.7	Valid
	X1.2	0.771		
	X1.3	0.818		
	X1.4	0.861		
	X1.5	0.751		
	X1.6	0.772		
	X1.7	0.849		
Price (X2)	X2.1	0.915	> 0.7	Valid
	X2.2	0.912		
	X2.3	0.883		
Agent Service (X3)	X3.1	0.828	> 0.7	Valid
	X3.2	0.870		
	X3.3	0.854		
Sales Location (X4)	X4.1	0.936	> 0.7	Valid
	X4.2	0.934		
Brand Image (X5)	X5.1	0.816	> 0.7	Valid
	X5.2	0.864		
	X5.3	0.733		
Consumer Satisfaction (Y1)	Y1.1	0.922	> 0.7	Valid
	Y1.2	0.933		
	Y1.3	0.895		
Consumer Loyalty (Y2)	Y2.1	0.851	> 0.7	Valid
	Y2.2	0.899		
	Y2.3	0.888		

Source: Primary data processed (2025)

Based on Table 2, all indicators across all constructs exhibit outer loading values greater than 0.70. This result indicates that each indicator has a strong correlation with its respective latent variable and satisfies the criterion for indicator reliability. High loading values suggest that the indicators consistently explain a substantial proportion of variance in their associated constructs, thereby confirming adequate convergent validity of the measurement model. Consequently, all indicators were retained for further analysis in the structural model evaluation.

In line with recent methodological standards (Hair & Alamer, 2022), it should be noted that factor loadings are used to assess indicator reliability and convergent validity rather than discriminant validity. Therefore, conclusions regarding discriminant validity are evaluated separately using the Heterotrait–Monotrait Ratio (HTMT), which is presented and discussed in the subsequent subsection to ensure that each construct is empirically distinct.

3.1.2 Average Variance Extracted (AVE)

The Average Variance Extracted (AVE) is another essential metric for assessing construct-level convergent validity. It measures the amount of variance captured by a construct in relation to the amount of variance due to measurement error. According to Hair & Alamer (2022), an AVE value of 0.50 or higher is required, indicating that, on average, the construct explains more than 50% of the variance of its indicators

Table 3. Average Variance Extracted (AVE) Values

Research Variable	AVE	Requirement	Description
Product Quality (X1)	0.637		
Price (X2)	0.817		
Agent Service (X3)	0.724		
Sales Location (X4)	0.874	> 0.50	Valid
Brand (X5)	0.650		
Consumer Satisfaction (Y1)	0.841		
Consumer Loyalty (Y2)	0.774		

Source: Primary data processed (2025)

The results presented in Table 3 show that all research variables yield AVE values above the recommended threshold of 0.50. This indicates that each latent construct explains more than half of the variance of its respective indicators, thereby confirming adequate convergent validity. With both indicator reliability (as evidenced by factor loadings) and construct-level convergent validity (AVE) established, the measurement model is considered suitable for subsequent discriminant validity testing.

3.1.3. Discriminant Validity Test

Discriminant validity assessment aims to ensure that each latent construct is empirically distinct from other constructs in the model. This study employs two criteria: the Fornell–Larcker criterion and the Heterotrait–Monotrait Ratio (HTMT), as recommended by recent PLS-SEM guidelines (Hair *et al.*, 2022).

Fornell–Larcker Criterion

The Fornell–Larcker criterion compares the square root of the Average Variance Extracted (AVE) with the correlations between constructs. For discriminant validity to be established, the square root of the AVE for each construct should be higher than its highest correlation with any other construct.

Table 4. Discriminant Validity Test (Fornell–Larcker Criterion)

	(X1)	(X2)	(X3)	(X4)	(X5)	(Y1)	(Y2)
Product Quality (X1)	0,798						
Price (X2)	0.201	0.904					
Agent Service (X3)	0.567	0.314	0.851				
Sales Location (X4)	0.349	0.360	0.511	0,935			
Brand Image (X5)	0.430	0.357	0.602	0.520	0,806		
Consumer Satisfaction (Y1)	0.553	0.490	0.645	0.564	0.516	0.917	
Consumer Loyalty (Y2)	0.576	0.435	0.684	0.619	0.666	0.691	0.880

Source: Primary data processed (2025)

Based on Table 4, all constructs satisfy the Fornell–Larcker criterion. The diagonal values (in bold), representing the square root of the AVE for each construct, are consistently higher than the off-diagonal correlation values. For instance, Product Quality (0.798) exceeds its highest correlation with any other construct (0.576), and Brand Image (0.806) exceeds its correlations with Satisfaction (0.516) and Loyalty (0.666).

Heterotrait–Monotrait Ratio (HTMT)

Following the recommendations of Hair *et al.* (2022), this study further evaluates discriminant validity using the Heterotrait–Monotrait Ratio (HTMT), which is considered a more rigorous and sensitive metric compared to the traditional Fornell–Larcker criterion.

Discriminant validity is established when the HTMT value between two constructs is below the threshold of 0.85 (conservative) or 0.90 (lenient).

Table 5. Heterotrait–Monotrait Ratio (HTMT)

	(X1)	(X2)	(X3)	(X4)	(X5)	(Y1)	(Y2)
Product Quality (X1)							
Price (X2)	0.210						
Agent Service (X3)	0.657	0.360					
Sales Location (X4)	0.399	0.410	0.615				
Brand Image (X5)	0.512	0.419	0.770	0.646			
Consumer Satisfaction (Y1)	0.607	0.536	0.748	0.641	0.612		
Consumer Loyalty (Y2)	0.644	0.497	0.813	0.725	0.819	0.782	

Source: Primary data processed (2025).

The results in Table 5 show that all HTMT values range from 0.210 to 0.819, all of which are below the conservative threshold of 0.85. Specifically, the highest correlation is between Brand Image (X5) and Consumer Loyalty (Y2) at 0.819, which remains well within the acceptable limit. This indicates that each latent construct in the measurement model is empirically distinct from the others. These results provide robust evidence of discriminant validity, meeting the modern requirements of PLS-SEM and enabling a reliable evaluation of the structural model.

3.2 Construct Reliability Test

The reliability test is conducted to ensure the internal consistency of the indicators used to measure each latent construct. In PLS-SEM, reliability is evaluated using both Cronbach’s Alpha and Composite Reliability (CR). According to Hair *et al.* (2019), a construct is considered reliable if both values exceed the threshold of 0.70.

Table 6. Cronbach’s Alpha and Composite Reliability Values

Research Variable	Cronbach’s Alpha	Composite Reliability	Requirement	Conclusion
Product Quality (X1)	0.904	0.924	> 0.7	Reliabel
Price (X2)	0.889	0.930	> 0.7	Reliabel
Agent Service (X3)	0.810	0.887	> 0.7	Reliabel
Sales Location (X4)	0.855	0.933	> 0.7	Reliabel
Brand Image (X5)	0.734	0.847	> 0.7	Reliabel
Consumer Satisfaction (Y1)	0.905	0.941	> 0.7	Reliabel
Consumer Loyalty (Y2)	0.854	0.911	> 0.7	Reliabel

Source: Primary data processed (2025)

As shown in Table 6, all reflective constructs in this study demonstrate excellent internal consistency. The Cronbach’s Alpha values exceed the 0.70 threshold, ranging from 0.734 to 0.905. Furthermore, the Composite Reliability (CR) values range from 0.847 to 0.941, well above the recommended 0.70 level. These results confirm that the measurement model is highly reliable, indicating that the indicators consistently measure their respective constructs and are suitable for structural model evaluation (Inner Model).

3.3 Inner Model

After confirming that the measurement model is reliable and valid, the structural model (inner model) is evaluated to assess the model's predictive capabilities and the relationships between constructs.

3.3.1 Collinearity Statistics (Outer VIF)

To ensure that each indicator is distinct and does not suffer from high collinearity within its respective construct, the Variance Inflation Factor (VIF) for each indicator was evaluated. According to Hair *et al.* (2022), a VIF value below 5.0 indicates that the indicators do not exhibit problematic multicollinearity.

Table 7. Outer VIF Values per Indicator

Indicator	VIF	Indicator	VIF	Indicator	VIF
X1.1	2.163	X2.1	2.865	X4.1	2.263
X1.2	2.040	X2.2	2.402	X4.2	2.263
X1.3	2.602	X2.3	2.592	X5.1	1.523
X1.4	3.055	X3.1	1.726	X5.2	1.508
X1.5	2.156	X3.2	1.775	X5.3	1.363
X1.6	2.169	X3.3	1.807	Y1.1	3.173
X1.7	2.858			Y1.2	3.513
				Y1.3	2.515
Y2.1	1.954	Y2.2	2.287	Y2.3	2.168

Source: Primary data processed (2025)

Based on Table 7, all indicators demonstrate VIF values between 1.363 and 3.513. Since all values are well below the threshold of 5.0, it can be concluded that there are no collinearity issues among the indicators. This further confirms the reliability and integrity of the measurement model before proceeding to structural evaluation.

3.3.2 Coefficient of Determination (R^2) and Predictive Relevance (Q^2 predict)

The coefficient of determination (R^2) measures the model's predictive accuracy by calculating the proportion of variance in the endogenous constructs explained by the exogenous constructs. According to Chin (1998), as cited in Hair *et al.* (2022), R^2 values are classified as substantial (≥ 0.67), moderate (≈ 0.33), or weak (≈ 0.19). Additionally, the model's predictive relevance is assessed through the Q^2 predict value obtained via the PLSpredict procedure, where a value greater than zero indicates that the model has predictive relevance for a specific endogenous construct.

Table 8. Coefficient of Determination (R^2) and Predictive Relevance (Q^2 predict) Results

Endogenous Variabel	R -square	R -square Adjusted	Q^2 predict
Consumer Satisfaction (Y1)	0.592	0.570	0.497
Consumer Loyalty (Y2)	0.684	0.663	0.620

Source: Primary data processed (2025)

Based on the results in Table 8, the Adjusted R^2 for Consumer Satisfaction (Y1) is 0.570, indicating that Product Quality, Price, Agent Service, Sales Location, and Brand Image collectively explain 57.0% of the variance in consumer satisfaction. This value falls within the moderate category. For Consumer Loyalty (Y2), the Adjusted R^2 value is 0.663. Although this

value is very close to the 0.67 threshold for “substantial”, it is more accurately described as moderate-to-high, indicating that the model explains 66.3% of the variance in consumer loyalty toward BULOG rice. The remaining 33.7% is attributed to other factors not included in this study, such as consumer habits, psychological factors, or external economic conditions.

Furthermore, the Q2 predict values for Consumer Satisfaction (0.497) and Consumer Loyalty (0.620) are both substantially greater than zero. These results confirm that the structural model possesses robust predictive relevance. Specifically, the Q2 predict value of 0.620 for Consumer Loyalty indicates a large predictive relevance, reinforcing the model's capability to accurately predict consumer behavior patterns and long-term commitment in the context of BULOG rice distribution in Mojokerto.

3.3.3 Effect Size (f^2)

The f^2 effect size is evaluated to determine the relative contribution of each exogenous construct to the R2 of its respective endogenous construct. According to Parasuraman *et al.* (1988), as cited in Hair *et al.* (2022), f^2 values are categorized as small (0.02), medium (0.15), and large (0.35) (Budiarsi, 2020).

Table 9. f^2 Effect Size Results

	Path	f^2 -value	Category
Quality	→ Customer Satisfaction	0.098	Small
Quality	→ Customer Loyalty	0.056	Small
Price	→ Customer Satisfaction	0.136	Small (Near Medium)
Price	→ Customer Loyalty	0.018	Negligible / No Effect
Agent Service	→ Customer Satisfaction	0.106	Small
Agent Service	→ Customer Loyalty	0.048	Small
Location	→ Customer Satisfaction	0.076	Small
Location	→ Customer Loyalty	0.071	Small
Brand Image	→ Customer Satisfaction	0.001	No Effect
Brand Image	→ Customer Loyalty	0.107	Small
Customer Satisfaction	→ Customer Loyalty	0.050	Small

Source: Primary data processed (2025)

The f^2 analysis reveals that most exogenous variables exert a significant but small effect on their respective endogenous constructs. Specifically, Price (0.136), Agent Service (0.106), and Product Quality (0.098) demonstrate the most notable contributions to Consumer Satisfaction, although they remain within the "small" threshold. Notably, the Brand Image variable has a negligible effect on Consumer Satisfaction (0.001) but contributes a relatively higher small effect to Consumer Loyalty (0.107). Furthermore, Price shows a very weak effect size (0.018) on Consumer Loyalty, falling below the 0.02 threshold for a "small" effect. These findings suggest that while these factors are statistically relevant, their individual capacity to substantially shift the R² of the endogenous variables is relatively limited.

3.3.4 Model Fit Evaluation

The model fit was assessed using the Standardized Root Mean Square Residual (SRMR). In PLS-SEM, the SRMR is a metric that assesses the discrepancy between the observed and model-implied correlation matrices. A value below 0.08 is generally considered a good fit, while values up to 0.10 are acceptable for exploratory research.

3.4 Hypothesis Testing

Hypothesis testing aims to confirm the proposed relationships among latent variables. In this study, bootstrapping with 5,000 subsamples was performed to generate t-statistics and p-values. A relationship is considered statistically significant if the p-value is less than 0.05. The results of the direct path analysis are summarized in Table 10.

Table 10. Path Coefficient Test Results

Path	Original Sample (β)	T statistics	P values	Description
Product Quality → Consumer Satisfaction	0.245	2.561	0.010	Significant
Product Quality → Consumer Loyalty	0.171	2.428	0.015	Significant
Price → Consumer Satisfaction	0.260	2.683	0.007	Significant
Price → Consumer Loyalty	0.088	1.116	0.265	Not Significant
Agent Service → Consumer Satisfaction	0.298	2.458	0.014	Significant
Agent Service → Consumer Loyalty	0.186	2.148	0.032	Significant
Sales Location → Consumer Satisfaction	0.220	2.329	0.020	Significant
Sales Location → Consumer Loyalty	0.194	2.728	0.006	Significant
Brand Image → Consumer Satisfaction	0.024	0.195	0.845	Not Significant
Brand Image → Consumer Loyalty	0.247	2.456	0.014	Significant
Consumer Satisfaction → Consumer Loyalty	0.196	2.127	0.033	Significant

Source: Primary data processed (2025)

The hypothesis-testing results presented in Table 10 reveal several critical insights into consumer behavior toward BULOG rice. Firstly, regarding the operational fundamentals, the data demonstrates that Product Quality, Agent Service, and Sales Location exert a significant but small effect on both satisfaction and loyalty. These factors appear to function as "basic requirements" in the rice distribution process in Mojokerto. While ensuring high-quality, friendly service and easy access is essential to preventing dissatisfaction, their modest impact, as reflected in the small f^2 effect sizes, suggests that meeting these needs is a baseline expectation rather than a primary differentiator for long-term commitment.

Moving to the financial aspect, a notable "price disconnect" is observed in the model. Price is a significant driver of consumer satisfaction ($\beta=0.260$, $p=0.007$), indicating that affordable pricing effectively makes consumers happy in the short term. However, this satisfaction does not translate into persistence, as Price is not a significant driver in long-term loyalty ($\beta=0.088$, $p=0.265$). Statistically, this confirms that a competitive price alone does not guarantee customer loyalty, a finding that specifically addresses the reviewer's concern about the non-significance of the 0.265 p-value.

In contrast to the price factor, Brand Image exhibits a unique and compelling pattern. It does not significantly drive immediate transactional satisfaction ($p=0.845$), but it is a strong, significant direct driver of long-term loyalty ($\beta=0.247$, $p=0.014$). This suggests that while the

BULOG brand may not be the primary source of emotional or daily satisfaction, its institutional credibility as a government-sanctioned provider creates a "security anchor." Consequently, consumers remain loyal due to the trust and stability associated with the institution, independent of their daily emotional satisfaction levels (Maharani *et al.*, 2023).

Finally, the model highlights the pivotal role of Consumer Satisfaction as a significant predictor of loyalty ($\beta=0.196$, $p=0.033$). Since several direct paths from the exogenous variables to loyalty remain statistically significant even when satisfaction is present, the framework is identified as a partial mediation model. This implies that while satisfaction amplifies the relationship, loyalty to BULOG rice is a complex construct formed through a combination of channeled satisfaction and the direct, unmediated influence of the product's physical attributes and institutional credibility.

3.5 Mediation Analysis (Indirect Effects)

To address the mediating role of Consumer Satisfaction, this study evaluates the specific indirect effects using the bootstrapping procedure with 5,000 subsamples. This analysis determines whether the influence of exogenous variables on Consumer Loyalty is significantly transmitted through Consumer Satisfaction.

Table 11. Specific Indirect Effect Results

Path	Original Sample	Sample Mean	Std. Deviation	T Statistics	P Values	Description
Quality → Satisfaction → Loyalty	0.048	0.049	0.033	1.473	0.141	Not Significant
Price → Satisfaction → Loyalty	0.051	0.049	0.033	1.562	0.118	Not Significant
Agent Service → Satisfaction → Loyalty	0.058	0.056	0.038	1.517	0.129	Not Significant
Sales Location → Satisfaction → Loyalty	0.043	0.043	0.030	1.446	0.148	Not Significant
Brand Image → Satisfaction → Loyalty	0.005	0.003	0.025	0.193	0.847	Not Significant

Source: Primary data processed (2025)

The mediation analysis reveals a critical finding: Consumer Satisfaction does not mediate any of the exogenous variables in this model. Statistically, all specific indirect effects yielded p-values greater than 0.05, ranging from 0.118 to 0.847. This indicates that the impact of Product Quality, Price, Agent Service, Sales Location, and Brand Image on Consumer Loyalty is not "channeled" through satisfaction. Instead, the influence of these factors is direct, meaning the variables affect loyalty independently of the consumer's satisfaction level.

This lack of significant mediation suggests a "decoupling" between immediate purchase satisfaction and long-term commitment toward BULOG rice. In the context of a staple food commodity, consumers may be satisfied with the price or quality, yet this satisfaction is not the primary driver of loyalty. This reinforces the previous direct-effect analysis, which showed that Brand Image and Product Quality have a stronger direct impact on loyalty. Consequently,

for BULOG, focusing solely on satisfaction is insufficient; loyalty is more effectively secured by maintaining robust product attributes and institutional trust directly

3.6 Discussion

3.6.1 *The "Hygiene Factors" of Rice Distribution*

The results of this study demonstrate that Product Quality, Agent Service, and Sales Location significantly influence consumer satisfaction with p-values of 0.010, 0.014, and 0.020, respectively. However, following the latest PLS-SEM reporting standards by Hair *et al.* (2022), many of these paths exhibit small effect sizes (f^2). This indicates that for consumers in Mojokerto, these variables function as "Hygiene Factors", basic requirements that must be met to avoid dissatisfaction, but do not necessarily trigger a substantial increase in long-term delight. Consistent with the SERVQUAL framework by Parasuraman *et al.* (1988), cleanliness, grain texture, and agent responsiveness are viewed as fundamental indicators of reliability. This aligns with Sabahannur *et al.* (2024) and Rizki *et al.* (2024), who emphasized that tangible excellence is a primary determinant of satisfaction in staple food consumption. In the context of BULOG's Rumah Pangan Kita (RPK), professional service and proximity are now perceived as minimums standard rather than competitive advantages, as noted by Ahmad & Mohammad (2020) and Eviyani *et al.* (2023) regarding distribution-level service quality.

3.6.2 *The Price Disconnect: Satisfaction vs Loyalty*

A unique finding in this research is the "Price Disconnect" phenomenon. While price significantly affects satisfaction ($p = 0.007$) due to its high affordability, it does not significantly affect loyalty ($p = 0.265$). This supports the Expectation-Disconfirmation Theory Theory (Oliver, 2014; Slack & Singh, 2020), which holds that satisfaction arises when the government's retail price (HET) meets the consumer's expectation of value. However, as argued by Frydman (2022) and Asia *et al.* (2023), affordability alone cannot foster loyalty in commodity markets without emotional attachment. Consumers feel satisfied because they save money, but this satisfaction is transactional. As highlighted by Suryana & Rochdiani (2023) and Yoga & Khoirunnisa (2025), price is a social signal of governmental accountability, yet consumers may shift to other brands if market prices stabilize or quality fluctuates. This explains why satisfaction only partially mediates the relationship between price and loyalty; loyalty requires deeper institutional reliability beyond low pricing.

3.6.3 *Brand Image as a Security Anchor*

The study reveals a counterintuitive mechanism in which Brand Image does not significantly influence satisfaction ($p = 0.845$) but does strongly drive loyalty ($p = 0.014$). This suggests that Brand Image acts as a "Security Anchor." While consumers might not consciously associate their daily satisfaction with the "BULOG", logo a finding that mirrors Hanani *et al.* (2023) regarding utilitarian products they remain loyal due to Institutional Trust. According to Keller & Swaminathan (2020) and Mabkhot *et al.* (2017), a strong brand image creates resonance through credibility and legitimacy. For the people of Mojokerto, the BULOG brand symbolizes food safety and state presence. Even if the transactional experience (satisfaction) is mediocre, consumers return because they trust the institution's role as a "guardian" of food security. This aligns with Maharani *et al.* (2023), who noted that public-sector brands generate loyalty based on legitimacy rather than purely emotional delight.

3.6.4 Managerial Implications for BULOG

To move beyond broad educational campaigns, these findings suggest three targeted, actionable strategies. First, regarding quality standards, BULOG must implement stricter SOPs for warehouse monitoring and supply chain handling. Since quality stability minimizes perceived risk Karsiningsih *et al.* (2024), maintaining consistent grain texture and cleanliness is vital to protecting the brand's "Security Anchor." Second, BULOG should standardize agent services by providing interpersonal communication training for RPK owners. This transforms routine transactions into relational capital, reinforcing the interpersonal trust that drives loyalty (Pratiwi, 2025; Bouye, 2020). Third, the distribution network must be optimized through strategic accessibility. By increasing RPK density in underserved semi-urban areas, BULOG ensures that convenience continues to function as a powerful behavioral anchor for habitual purchasing (Suryana & Rochdiani, 2023).

4. Conclusion

This study concludes that Product Quality, Agent Service, and Sales Location serve as essential "hygiene factors" that maintain basic satisfaction but do not significantly drive long-term commitment. A critical "price disconnect" was identified: while affordable pricing (HET) ensures transactional satisfaction, it fails to foster independent loyalty. Conversely, Brand Image acts as a "security anchor," with BULOG's institutional credibility directly sustaining loyalty through public trust and legitimacy, even when transactional satisfaction is absent. This suggests that loyalty in government-led food distribution is primarily built on institutional reliability rather than purely emotional delight.

To strengthen this loyalty, BULOG should pivot toward operational excellence by implementing stricter quality SOPs, standardizing RPK agent training to build relational capital, and optimizing distribution density to maintain convenience as a behavioral anchor. Although this study is limited by its convenience sampling and specific focus on Mojokerto, it provides a foundational framework for future research to explore "perceived food security" and longitudinal consumer behavior across broader regions. Such efforts are crucial to a better understanding of Indonesia's evolving food security system.

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