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Prioritising Marketing Strategies for Tempe and Tofu MSMEs in Bogor: A Marketing Mix and TOPSIS Approach

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ABSTRACT

Tempe and tofu micro, small, and medium enterprises (MSMEs) face many possible marketing strategies but have limited resources to implement them, while the Free Nutritious Meal Program (Makan Bergizi Gratis, MBG) has opened an emerging institutional market. This study aimed to assess the marketing conditions of tempe and tofu MSMEs in Bogor, Indonesia, using the marketing mix, to formulate alternative marketing strategies, and to determine their priority order. Data were collected from eight MSMEs, comprising four medium-sized and four small enterprises, through a 43-indicator Likert questionnaire, short interviews, and observation, and were analysed descriptively and thematically. Seven alternative strategies were evaluated by five experts against six criteria using the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), followed by sensitivity analysis. Overall marketing conditions were good (mean 3.72 on a 1–5 scale), with place scoring highest (3.93) and promotion lowest (3.35). Medium-sized enterprises scored higher than small enterprises (4.28 vs. 3.16), while the mean scores for tempe and tofu enterprises were 3.91 and 3.52, respectively. Distribution channel expansion ranked first (C_i = 0.726), followed by pricing strategy (0.593) and strengthening institutional market access through the MBG Program (0.588). Distribution channel expansion remained first in all 13 criterion-weighting scenarios. However, the leave-one-expert-out analysis showed that the ranking was sensitive to panel composition, as institutional market access through MBG moved to first place when the academic expert was excluded. Strategies with high market impact but lower implementation feasibility, namely market area development, brand strengthening, and product diversification, ranked lower. These findings indicate that marketing priorities should consider both implementation feasibility and the resource capacity of MSMEs.

Keywords: Agro-industry, Marketing mix, MSMEs, Tempe and tofu, TOPSIS JEL Classification: C44, L66, M31, Q13

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INTRODUCTION

Tempe and tofu are among the most widely consumed soybean-based foods in Indonesia and remain an affordable source of plant protein for households (Astawan, 2020). National consumption has been relatively stable over the last five years, reaching 0.152 kg per capita per week for tofu and 0.142 kg for tempe in 2025 (Badan Pusat Statistik, 2026). At this level, the two products supply roughly 5.94 g of protein per capita per day, or about 10.4% of the average daily requirement of 57 g (Kementerian Kesehatan Republik Indonesia, 2019). The industry is dominated by micro, small, and medium enterprises (MSMEs) that contribute to local employment and household income (Akmir et al., 2024; Ali et al., 2023). In Bogor, the Indonesian Tempe and Tofu Producers' Cooperative (KOPTI) of Bogor Regency alone recorded 1,396 member producers in 2020, comprising 1,046 tempe and 350 tofu producers who directly employed 5,907 workers (Albarsyah, 2020).

A new market opportunity has emerged from the Free Nutritious Meal Program (Makan Bergizi Gratis, MBG), a national programme that aims to improve the nutritional status of schoolchildren, pregnant and lactating women, and toddlers (Badan Gizi Nasional, 2025). The initial 2025 target of 17.9 million beneficiaries, including 15.5 million schoolchildren, was later raised to 82.9 million people (Kementerian Keuangan Republik Indonesia, 2025). A simple simulation shows that if tempe and tofu were each served once a week at 50 g per child, the additional requirement for 15.5 million schoolchildren alone would reach about 1,550 tonnes per week, equivalent to approximately 80,600 tonnes per year if the same weekly serving assumption were maintained. This figure represents potential rather than confirmed demand, because actual market absorption depends on the number of beneficiaries served, local menu planning, programme coverage, procurement decisions by individual SPPG units, and the ability of MSMEs to meet product specifications, food safety requirements, production capacity, and delivery schedules. Therefore, the estimated volume should not be interpreted as a guaranteed market opportunity for local MSMEs. Although MBG creates an emerging institutional market for local producers, access to this market remains conditional on procurement arrangements and the capacity of enterprises to meet the required standards.

Tempe and tofu MSMEs nonetheless face persistent marketing challenges. Their products are relatively homogeneous, so competition is intense and consumers can easily switch between producers. Many enterprises still rely on conventional channels, selling to nearby consumers, retailers, and traditional markets, and make limited use of digital media for promotion (Hariani et al., 2022; Widagdo et al., 2024). Raw material costs are subject to pressure because Indonesia remains highly dependent on imported soybeans, making tempe and tofu producers vulnerable to fluctuations in soybean prices and input costs (Kusuma et al., 2025; Sibuea et al., 2024). Limited capability to formulate marketing strategies further restricts their ability to compete and reach wider markets (Herdiani, 2024), while institutional buyers require consistent quality, food safety, and reliable delivery. As a result, enterprises face many possible marketing actions but have limited capital, labour, and time to pursue them all.

The marketing mix, consisting of product, price, place, and promotion, offers a widely used framework for diagnosing the controllable elements of marketing (Kotler & Armstrong, 2018; Kotler & Keller, 2016). Previous studies on Indonesian MSMEs have shown that marketing mix elements and digital marketing are associated with higher revenue (Siregar et al., 2025), purchase decisions (Mulyani, 2025; Prata et al., 2023), sales volume (Arista et al., 2025), and marketing performance (Fadhillah et al., 2024). However, these studies mainly test the effects of marketing elements. They do not tell resource-constrained enterprises which strategy should be pursued first when several options compete for the same limited resources.

Multi-criteria decision-making methods address this prioritisation problem. The Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) ranks alternatives according to their closeness to a positive ideal solution and their distance from a negative ideal solution (Hwang & Yoon, 1981), and it has been applied widely because of its transparent and computationally simple procedure (Behzadian et al., 2012; Taherdoost & Madanchian, 2024; Zavadskas et al., 2016). Recent applications include infrastructure location decisions (Elghanam et al., 2023), barriers to halal certification in MSMEs (Utama et al., 2025), and marketing strategy priorities derived from SWOT analysis (Aljahra et al., 2025) or blue ocean strategy (F. A. Putri et al., 2025). Studies that combine the marketing mix with TOPSIS have also emerged (Diniaty & Nur, 2025), including one on a single processed tofu product (A. A. A. Putri et al., 2025). However, limited attention has been given to studies that jointly examine tempe and tofu enterprises, incorporate institutional market access through the MBG Program, and assess the stability of marketing strategy priorities under changes in criterion weights and expert composition.

This study addresses these gaps in three ways. First, it applies an integrated marketing mix and TOPSIS approach to tempe and tofu MSMEs while explicitly considering the Strengthening Institutional Market Access

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through the MBG Program. Second, the alternative strategies are derived from the lowest-scoring marketing mix indicators and interview findings rather than proposed directly by the researchers. Third, the evaluation criteria separate implementation feasibility (cost, time, and ease) from expected impact (sales, market expansion, and sustainability), which makes it possible to show how feasibility shapes strategic priorities, and the robustness of the ranking is tested through a sensitivity analysis. Accordingly, the objectives were to (1) assess the marketing conditions of tempe and tofu MSMEs in Bogor based on the marketing mix, (2) formulate alternative marketing strategies from these conditions, and (3) determine the priority order of the strategies using TOPSIS. Unlike previous studies, this research derives strategic alternatives directly from measured marketing mix conditions and interview findings, incorporates an emerging institutional market opportunity, and evaluates the robustness of TOPSIS rankings through sensitivity analysis.

METHODS

Research Design and Setting

The study used a sequential design with three stages, namely (1) a descriptive assessment of marketing conditions based on the marketing mix, complemented by short interviews, (2) the formulation of alternative marketing strategies, and (3) the prioritisation of these strategies through expert-based TOPSIS followed by a sensitivity analysis. Data were collected from March to September 2026 in Bogor, West Java, which was selected purposively because of its developed tempe and tofu agro-industry and its emerging institutional market through MBG.

Participants

Eight MSMEs were studied in two groups, each consisting of two tempe and two tofu enterprises, to compare marketing conditions across two operational business-scale categories (Table 1). In this study, enterprise scale was operationally classified into small and medium-sized enterprises based on business characteristics and market position, rather than daily production volume alone. The four medium-sized enterprises were purposively selected based on three criteria: formal legal status, wide recognition in Bogor, and reputation as market leaders according to an informal pre-survey of consumers and traditional market traders. The four small enterprises did not meet these selection criteria and were included based on their owners' willingness to participate. Daily production capacity was recorded separately to describe the operational characteristics of each enterprise. Two other enterprises that were invited declined to participate. Each enterprise was represented by one respondent, namely the owner, except F1, where the marketing mix questionnaire was completed by the production planning and inventory control staff. Enterprises are reported with codes to protect confidentiality. Given the limited number and purposive selection of enterprises, the findings describe the studied cases and are not intended for statistical generalisation.

Table 1. Profile of the studied enterprises

Code	Product	Group	Years	Workers	Daily production	Main market reach
F1	Tempe	Medium-sized	14	>40	0.8–1 tonne	Greater Jakarta and other major cities, export trials, MBG
F2	Tempe	Medium-sized	6	230	5.5 tonnes	Greater Jakarta, Bandung, export to six countries, MBG
F3	Tofu	Medium-sized	30	>70	±2.5 tonnes	Greater Jakarta, Surabaya
F4	Tofu	Medium-sized	16	35	25,000 pieces	Greater Jakarta, Cianjur (restaurants)
F5	Tempe	Small	33	4	200 kg (450–500 kg at peak MBG demand)	Local markets, institutions, MBG kitchens
F6	Tempe	Small	35	2	100 kg	One local market, six MBG kitchens
F7	Tofu	Small	36	3	50 kg (previously 250 kg)	Local markets in Bogor
F8	Tofu	Small	13	8	200 kg	Local markets in Bogor, MBG (irregular)

Source: Primary data (2026).

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Five experts evaluated the alternative strategies (Table 2). They were purposively selected based on their professional positions, relevant expertise, institutional responsibilities, and direct involvement in the tempe and tofu sectors. The panel comprised four stakeholder groups relevant to the marketing and institutional supply chain: business actors, the producers' cooperative, a nutrition service unit, and academia. E1 and E4 represented the tempe and tofu business sectors, respectively, providing enterprise-level perspectives on production and business management. E2 contributed a cooperative perspective on producer coordination, while E3 provided insights into institutional food procurement through the SPPG system. E5 contributed an academic perspective in food and nutrition research. This composition enabled the assessment to incorporate complementary perspectives on enterprise operations, producer coordination, institutional market access, and food-related considerations.

A five-member panel was considered appropriate for this context-specific expert-based TOPSIS assessment because the selection focused on obtaining relevant and complementary stakeholder knowledge rather than statistical representation. Each expert assessed the same seven strategic alternatives against six predefined criteria, and their judgements were aggregated using the arithmetic mean. This procedure provided a structured basis for comparing strategic priorities across the selected stakeholder perspectives. However, the five experts should not be interpreted as statistically representative of all actors in the tempe and tofu supply chain in Bogor Regency.

Table 2. Expert panel

Code	Stakeholder group	Position and expertise
E1	Business actor (tempe)	President director and owner of a medium-sized tempe enterprise and developer of a tempe production innovation centre
E2	Producers' cooperative	Head of administration and finance and field coordinator of KOPTI
E3	Nutrition service unit	Head of an SPPG unit, involved since its establishment
E4	Business actor (tofu)	Director of a medium-sized tofu enterprise, with expertise in management and systems development
E5	Academia	Food and nutrition researcher at the National Research and Innovation Agency (BRIN)

Source: Primary data (2026).

Instrument and Data Collection

Data were collected through direct observation, a questionnaire, short semi-structured interviews, and field documentation, and the sources were triangulated. The questionnaire initially contained 46 statements developed from the dimensions of each marketing mix element (Kotler & Armstrong, 2018; Kotler & Keller, 2016). Product covered variety, quality, design, features, brand name, packaging, and services. Price covered list price, discounts and allowances, payment period, and credit terms. Place covered channels, coverage, locations, inventory, transportation, and logistics, and promotion covered advertising, personal selling, sales promotion, and public relations. One additional item concerning the distribution system's support for institutional markets, such as SPPG or MBG, was included under the place element. Content validity was examined through an expert review by a food and nutrition researcher (E5), who assessed the clarity, substance, and contextual relevance of each statement.

Data screening found no missing values. The initial instrument consisted of 46 statements. During data screening, three indicators in the price variable were excluded from the analysis, resulting in 43 indicators for the final descriptive analysis. The final instrument therefore comprised 43 indicators: 13 for product, 8 for price, 13 for place, and 9 for promotion. The discount dimension remained represented by items on bundling and special prices for loyal customers. Statistical validity and reliability tests, such as item–total correlations and Cronbach's alpha, were not performed because eight respondents are insufficient for stable estimates. All items used a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) and were positively worded. Although item scores are ordinal, means were used only as descriptive measures. Element means were calculated as the average of their items, and the overall mean as the average of the four elements. Means were interpreted using five categories with a class interval of $(5 - 1)/5 = 0.80$: 1.00–1.80 very poor, 1.81–2.60 poor, 2.61–3.40 fair, 3.41–4.20 good, and 4.21–5.00 very good. Scores were also compared by product type and business scale.

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The short interviews consisted of eight open questions on marketing constraints, sales declines, competitors, competitive advantages, successful strategies, desired changes, and considerations in choosing strategies. Responses were analysed using thematic content analysis (Braun & Clarke, 2006; Miles et al., 2014). Each answer was divided into units of meaning, coded, grouped into themes, and mapped to a marketing mix element or to factors outside the marketing mix, and the number of enterprises mentioning each theme was counted. The themes were then compared with the questionnaire scores to confirm, explain, or complement them.

Formulation of Alternative Strategies

Alternative strategies were formulated from the lowest-scoring indicators within each marketing mix element and from the interview themes, taking into account the resources available to the enterprises and the opportunities for market expansion, including the Strengthening Institutional Market Access through the MBG Program. This process produced seven alternatives, which are presented in the Results.

TOPSIS Procedure

Each expert completed an assessment sheet that summarised the marketing mix findings and defined the six criteria operationally. In one section, the experts rated the importance of each criterion on a scale of 1 to 5. In a separate section, they rated the performance of each alternative on each criterion, also on a 1–5 scale. The criteria were cost affordability (C1), implementation speed (C2), ease of implementation (C3), sales growth potential (C4), market expansion potential (C5), and long-term sustainability (C6). Because a higher score on every criterion indicated a more desirable condition, for example a score of 5 on C1 meant very affordable and a score of 5 on C2 meant very fast, all six criteria were treated as benefit criteria (Hwang & Yoon, 1981). Expert ratings were averaged to form the decision matrix. The mean importance ratings were normalised by dividing each by their sum (26.00) to obtain the weights in Table 3.

Table 3. Evaluation criteria and weights

Code	Criterion	Mean importance	Normalised weight
C1	Cost affordability	4.60	0.177
C2	Implementation speed	3.60	0.138
C3	Ease of implementation	4.00	0.154
C4	Sales growth potential	4.40	0.169
C5	Market expansion potential	4.80	0.185
C6	Long-term sustainability	4.60	0.177

Source: Aggregated expert judgements (2026). All criteria are benefit criteria.

The decision matrix was normalised using vector normalisation:

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^2}} \quad (1)$$

where x_{ij} is the mean score of alternative i on criterion j and m is the number of alternatives. The weighted normalised matrix was obtained as:

$$v_{ij} = w_j \times r_{ij} \quad (2)$$

where w_j is the normalised weight of criterion j. Because all criteria are benefit criteria, the positive and negative ideal solutions were defined as:

$$A^+ = \{max_i v_{ij}\}, \quad A^- = \{min_i v_{ij}\} \quad (3)$$

The distances of each alternative from the two ideal solutions were then calculated as:

$$D_i^+ = \sqrt{\sum_{j=1}^{n} (v_{ij} - v_j^+)^2}, \quad D_i^- = \sqrt{\sum_{j=1}^{n} (v_{ij} - v_j^-)^2} \quad (4)$$

and the preference value (closeness coefficient) as:

$$C_i = \frac{D_i^-}{D_i^+ + D_i^-} \quad (5)$$

Alternatives were ranked by descending C_i, with values closer to 1 indicating higher priority. Calculations were performed in Microsoft Excel and cross-checked through an independent recalculation.

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Sensitivity Analysis

The stability of the ranking was tested in three ways: by changing the weight of each criterion by −20% and +20% one at a time while holding the others constant (12 scenarios), by applying equal weights to all criteria (one scenario), and by recalculating TOPSIS with one expert excluded at a time (five scenarios).

RESULTS

Marketing Conditions of Tempe and Tofu MSMEs

Overall, the marketing conditions of the studied enterprises were good, with a mean of 3.72 (Table 4). Place obtained the highest mean (3.93) and the lowest standard deviation (0.81), followed by price (3.88) and product (3.71). Promotion obtained the lowest mean (3.35, fair) and the highest standard deviation (1.08), indicating that it was both the weakest element and the most unevenly applied across enterprises. At the indicator level, product quality and consistency scored highest (4.50), whereas product variety scored lowest (3.25). Within price, list prices and price affordability scored 4.13–4.25, but bundling or bulk-purchase promotions scored only 2.38. Within place, location, product availability, and delivery scored 4.25–4.50, yet reach beyond Bogor (3.00) and monthly growth in market reach (3.25) were considerably lower. Within promotion, direct communication with customers scored 4.00–4.25, whereas the use of digital media and paid advertising scored 2.38–2.88, and active search for institutional market opportunities scored 2.88.

Table 4. Marketing mix conditions by element, product type, and business scale

Element	Items	Mean	SD	Category	Tempe	Tofu	Medium-sized	Small
Product	13	3.71	0.99	Good	3.87	3.56	4.44	2.98
Price	8	3.88	0.92	Good	4.00	3.75	4.34	3.41
Place	13	3.93	0.81	Good	4.17	3.69	4.39	3.48
Promotion	9	3.35	1.08	Fair	3.61	3.08	3.95	2.75
Overall	**43**	**3.72**	**0.95**	**Good**	**3.91**	**3.52**	**4.28**	**3.16**

Note: SD = mean of item standard deviations. Each group consists of four enterprises. Source: Primary data (2026).

Aggregate means, however, concealed substantial differences between enterprises. The gap between medium-sized and small enterprises (4.28 vs. 3.16, a difference of 1.12) was substantially larger than the gap between tempe and tofu enterprises (3.91 vs. 3.52, a difference of 0.39). This indicates that business scale was more strongly associated with differences in marketing conditions than product type in the studied cases. The differences were particularly evident in the promotion element, where medium-sized enterprises scored 3.95 compared with 2.75 for small enterprises. Interviews provided further context for this gap. Small enterprises reported narrow sales areas, high transportation costs, limited production and storage facilities, and difficulties maintaining market access when a main traditional market closed. They also faced limited financial resources, which constrained their ability to allocate funds for marketing activities, product development, and improvements in production facilities. In addition, they lacked clearly defined target markets, making it more difficult to direct their limited resources towards specific customer segments. In contrast, medium-sized enterprises generally had better market knowledge, clearer target-market identification, and greater capacity to manage distribution and pricing. These findings suggest that differences in marketing performance are associated with variations in resources, market networks, and operational capacity, rather than product type alone. Because each group consisted of only four enterprises, these comparisons should be interpreted descriptively rather than as evidence of a statistically significant relationship.

The interviews helped to explain these scores. The most frequently mentioned constraint was limited distribution and market reach (five enterprises), followed by price competition, limited production and storage facilities (four enterprises each), and fluctuating soybean and packaging prices (three enterprises). Small enterprises reported basic constraints, such as narrow sales areas, high transport costs, and the closure of a main traditional market, whereas medium-sized enterprises reported constraints related to production capacity and the storage needed to maintain quality during distribution. These findings indicate that the high

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place score reflects smooth distribution within markets that are already served rather than the ability to reach new areas. Thin margins and volatile input costs also explain the low score for price promotions. Product quality consistency was the most frequently cited competitive advantage (five enterprises), which is consistent with the highest product indicator, whereas product variety was mentioned only by two medium-sized tempe enterprises.

Four enterprises reported that digital marketing had been their most successful strategy, through trend-based content, a website and Instagram, TikTok, and a Google Maps listing. For two small enterprises (F5 and F8), this simple digital presence was associated with receiving supply offers from MBG kitchens. The remaining enterprises relied on personal selling, word of mouth, and bazaars, which explains the high variability of the promotion scores. Five of the eight enterprises stated that, given sufficient resources, they would expand their market areas, outlets, or distribution hubs. The considerations most often cited when choosing a strategy were target market size, location and distribution channels, and budget, which correspond closely to the cost affordability (C1) and market expansion (C5) criteria. Small enterprises also tended to lack a clearly defined target market, focusing instead on selling all products on the same day, and were reluctant to raise prices, whereas medium-sized enterprises understood their target markets and competitors and priced according to the value offered.

Alternative Marketing Strategies

Based on the marketing mix assessment and the interview findings, seven alternative strategies were formulated (Table 5). Market area development (S5) and distribution channel expansion (S4) correspond to the reach gap and to the desire of five enterprises to expand. Brand strengthening (S2) and product diversification (S1) correspond to weak variety and to quality advantages that small enterprises have not yet communicated as added value. Pricing strategy (S3) responds to price competition and to the low use of bundling, while promotion (S6) and Strengthening Institutional Market Access through the MBG Program (S7) build on the finding that two small enterprises had received supply offers from MBG kitchens.

Table 5. Alternative marketing strategies

Code	Alternative strategy	Basis of formulation
S1	Product diversification according to market needs	Limited product variety (product)
S2	Brand strengthening (brand name and logo on packaging)	Brand and packaging not yet optimal (product)
S3	Pricing strategy (bundling and loyal-customer prices)	Low use of discounts and bundling (price)
S4	Distribution channel expansion	Strong distribution with room to expand (place)
S5	Market area development	Limited reach beyond the local area (place)
S6	Promotion and participation in social activities	Weak promotion (promotion)
S7	Strengthening Institutional Market Access through the MBG Program	Institutional market opportunity created by the MBG Program (place)

Source: Research analysis (2026).

TOPSIS Prioritisation

Table 6 presents the aggregated decision matrix together with the distances, preference values, and ranks. The positive ideal solution for the weighted matrix was (0.082, 0.063, 0.070, 0.070, 0.079, 0.075) and the negative ideal solution was (0.053, 0.042, 0.049, 0.053, 0.056, 0.055). Distribution channel expansion (S4) ranked first with a preference value of 0.726, followed by pricing strategy (S3, 0.593), Strengthening Institutional Market Access through the MBG Program (S7, 0.588), and market area development (S5, 0.564). Brand strengthening (S2, 0.405) and product diversification (S1, 0.404) obtained almost identical values, while promotion and social activities (S6, 0.249) ranked last (Figure 1). As an illustration, S4 had weighted values of 0.074, 0.054, 0.063, 0.065, 0.079, and 0.072, giving $D^+ = 0.016$ and $D^- = 0.041$, and therefore $C_i = 0.041/(0.016 + 0.041) = 0.726$.

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Table 6. Decision matrix, distances, preference values, and ranks

Alternative	C1	C2	C3	C4	C5	C6	D+	D−	*Ci*	Rank
S4 Distribution channel expansion	3.60	3.60	3.60	4.40	4.80	4.20	0.016	0.041	0.726	1
S3 Pricing strategy	3.60	4.00	3.60	4.60	4.00	3.40	0.024	0.036	0.593	2
S7 Strengthening Institutional Market Access through the MBG Program	4.00	4.20	4.00	4.20	3.60	3.20	0.030	0.042	0.588	3
S5 Market area development	3.00	3.20	3.20	4.80	4.80	4.40	0.029	0.038	0.564	4
S2 Brand strengthening	2.60	2.80	2.80	4.40	4.40	4.40	0.042	0.029	0.405	5
S1 Product diversification	2.80	2.80	2.80	4.40	4.60	4.00	0.040	0.027	0.404	6
S6 Promotion and social activities	3.00	3.40	3.00	3.60	3.40	3.60	0.044	0.014	0.249	7

Note: C1–C6 are mean expert scores (1–5). Source: Research analysis (2026).

Sensitivity Analysis

Table 7 shows that S4 remained first in all 13 criterion-weighting scenarios, while S6 ranked last in all 13 scenarios. S3, S7, and S5 exchanged positions between second and fourth due to their relatively close preference values (0.564–0.593). Similarly, S1 and S2 exchanged fifth and sixth positions. These results indicate three priority groups: S4 as the main priority, S3, S7, and S5 as the second group, and S1, S2, and S6 as the lower-priority group.

The leave-one-expert-out analysis showed that S4 remained the first priority in four of the five scenarios. However, when the academic expert (E5) was excluded, S7 moved to first place and S4 dropped to second. This change indicates that the ranking was sensitive to the composition of the expert panel, particularly in distinguishing between S4 and S7. Although E5's assessment contributed to the aggregate ranking, the analysis does not establish that the expert was biased or that the assessment was incorrect. Overall, S4 was robust to changes in criterion weights, but its first-place position was sensitive to the composition of the expert panel. Therefore, the TOPSIS results should be interpreted as context-specific priorities based on the combined judgements of the five selected experts.

Table 7. Sensitivity of the priority order

Scenario	Priority order
Base weights	S4 > S3 > S7 > S5 > S2 > S1 > S6
C1 weight −20%	S4 > S5 > S3 > S7 > S2 > S1 > S6
C1 weight +20%	S4 > S7 > S3 > S5 > S1 > S2 > S6
C2 weight −20%	S4 > S3 > S7 > S5 > S1 > S2 > S6
C2 weight +20%	S4 > S3 > S7 > S5 > S2 > S1 > S6
C3 weight −20%	S4 > S3 > S7 > S5 > S1 > S2 > S6
C3 weight +20%	S4 > S7 > S3 > S5 > S2 > S1 > S6
C4 weight −20%	S4 > S7 > S3 > S5 > S2 > S1 > S6
C4 weight +20%	S4 > S3 > S7 > S5 > S1 > S2 > S6
C5 weight −20%	S4 > S7 > S3 > S5 > S2 > S1 > S6
C5 weight +20%	S4 > S3 > S5 > S7 > S1 > S2 > S6
C6 weight −20%	S4 > S3 > S7 > S5 > S1 > S2 > S6
C6 weight +20%	S4 > S5 > S3 > S7 > S2 > S1 > S6
Equal weights	S4 > S7 > S3 > S5 > S2 > S1 > S6
Without E1 (business actor, tempe)	S4 > S3 > S7 > S5 > S1 > S2 > S6
Without E2 (cooperative)	S4 > S5 > S3 > S7 > S2 > S1 > S6

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Scenario	Priority order
Without E3 (nutrition service unit)	S4 > S3 > S5 > S7 > S6 > S2 > S1
Without E4 (business actor, tofu)	S4 > S5 > S7 > S1 > S3 > S2 > S6
Without E5 (academia)	S7 > S4 > S3 > S5 > S1 > S2 > S6

Source: Research analysis (2026).

DISCUSSION

Distribution channel expansion ranked first because it combined high expected impact with moderate feasibility. S4 and S5 shared the highest score for market expansion potential (4.80), which was also the criterion with the largest weight. S4 also scored well on sales growth (4.40) and sustainability (4.20), while obtaining 3.60 on all three feasibility criteria. This result is consistent with the marketing mix assessment: place was the strongest element, suggesting that enterprises can build on existing distribution capabilities by adding retailers, resellers, small shops, and online platforms. It also aligns with the expansion plans reported by five enterprises. Distribution channel expansion and market area development are related but distinct: the former adds intermediaries or distribution routes, whereas the latter extends geographical market coverage.

Pricing strategy and strengthening institutional market access through the MBG programme followed closely. Pricing strategy obtained the highest score for sales growth potential (4.60), together with relatively fast and affordable implementation. This reflects the low current use of bundling (2.38) and price competition reported in the interviews. However, its sustainability score (3.40) suggests that price promotions must be managed carefully to avoid eroding profit margins, particularly given the cost pressures associated with Indonesia's dependence on imported soybeans (Sibuea et al., 2024). Strengthening institutional market access through the MBG programme obtained the highest feasibility scores (4.00, 4.20, and 4.00 for C1–C3), indicating that experts considered it relatively feasible in terms of cost, implementation speed, and ease. However, this assessment does not mean that all local enterprises can automatically access SPPG procurement opportunities. Interviews showed that digital visibility was associated with two small enterprises receiving supply offers from MBG kitchens. One of these enterprises reported an increase in daily production from 200 kg to 450–500 kg during periods of peak MBG demand. Nevertheless, these cases indicate initial market access rather than widespread or sustained market absorption.

The sustainability score of S7 (3.20) was the lowest among the seven strategies, indicating potential risks associated with dependence on a government programme. Although the MBG programme offers opportunities to expand institutional market access, excessive reliance on this market may expose MSMEs to buyer concentration risks. Changes in government priorities, programme coverage, procurement arrangements, or budget allocation may reduce or interrupt institutional demand. In addition, delays in budget disbursement or payments from institutional buyers may create cash-flow pressures, particularly for small enterprises that require regular working capital to purchase soybeans, maintain production, and meet daily operational expenses. Such conditions could affect their ability to sustain production and fulfil subsequent orders. Therefore, institutional market access should be developed as a complementary channel rather than the sole source of revenue. MSMEs need to maintain existing customer networks and develop alternative market channels to reduce dependence on a single buyer. Strengthening financial management, maintaining adequate working capital, and establishing clear payment agreements with institutional buyers are also important to support business continuity.

Presidential Regulation No. 115 of 2025 establishes the governance framework for MBG, while National Nutrition Agency Regulations No. 4 and No. 5 of 2026 address food safety and quality assurance and nutritional standards, respectively (Badan Gizi Nasional, 2026a, 2026b; Republik Indonesia, 2025). For tempe and tofu MSMEs, these regulations highlight the importance of meeting food safety, product quality, and nutritional requirements. Product standardisation should also consider the specifications established by individual SPPG units, including product quality, food safety, packaging, quantity, and delivery consistency. Local menu planning may influence the type, form, and quantity of tempe and tofu required. Therefore, the potential demand estimated in this study cannot be directly translated into actual procurement volume for local MSMEs. Access to institutional supply chains depends on enterprises' ability to meet these requirements and on procurement decisions made at the local level. Accordingly, the estimated requirement of 1,550 tonnes per week represents an aggregate, assumption-based scenario rather than a confirmed procurement target. Only the quantities specified in local menu planning and actually ordered by SPPG units can translate into purchases from MSMEs.

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Coordination among MSMEs, SPPG units, KOPTI, and local governments is important to clarify procurement requirements and strengthen supplier readiness. MSMEs can begin by identifying nearby SPPG units and understanding their supplier requirements, while KOPTI and local governments can facilitate access to market information, provide guidance on food quality and safety standards, strengthen production capacity, and connect enterprises with potential institutional buyers. Actual market absorption will depend on beneficiary coverage, local menu selection, procurement decisions, and enterprises' ability to fulfil supply requirements consistently. The TOPSIS ranking of S7 represents expert assessment of its strategic priority from a marketing perspective, rather than a direct evaluation of production or financial feasibility. Sensitivity analysis showed that S7 ranked first when E5 was excluded, whereas S4 remained first in the other expert-exclusion scenarios. This indicates that the priority assigned to institutional market access is sensitive to expert panel composition and should therefore be interpreted with caution.

Market area development, brand strengthening, and product diversification illustrate how feasibility shapes strategic priorities. Market area development obtained high impact scores (4.80, 4.80, and 4.40 for C4–C6), but the experts judged it costlier, slower, and harder to implement (3.00, 3.20, and 3.20), as expansion beyond Bogor requires additional logistics, transportation, and new marketing networks. Brand strengthening and product diversification also had relatively high impact scores (4.00–4.60), but the lowest feasibility scores (2.60–2.80), reflecting the resources required for brand and packaging design, new product development, and production adjustments.

These structural constraints may help explain the difference in marketing performance between medium-sized and small enterprises, which recorded mean scores of 4.28 and 3.16, respectively. Small enterprises generally have more limited financial resources, production facilities, and access to wider marketing networks, which may restrict their ability to adopt marketing practices implemented by medium-sized enterprises. Although digital platforms offer relatively affordable promotional opportunities, effective utilisation still requires adequate digital skills, consistent content management, product documentation, and the capacity to respond to customer enquiries and orders. Similarly, product diversification requires investment in product trials, raw materials, packaging, equipment, and quality control. These investments may be difficult to prioritise when enterprises must allocate limited funds to daily production and operational needs. Furthermore, Indonesia's dependence on imported soybeans exposes tempe and tofu producers to raw material cost pressures associated with fluctuations in import prices. For small enterprises, these cost pressures may further reduce the financial flexibility available for marketing development and product innovation. However, the present study does not directly quantify the effect of soybean price changes on each enterprise's production costs or investment capacity (Sibuea et al., 2024).

The marketing gaps addressed by these strategies were concentrated among small enterprises, particularly in market reach beyond Bogor, product variety, and logo recognisability. This supports the importance of matching strategic priorities with enterprise resource constraints rather than focusing solely on potential impact (Nuche et al., 2024; Suryawan et al., 2025). Small enterprises should implement these strategies gradually, starting with improvements that require relatively limited resources, such as establishing a consistent brand identity and improving existing product presentation. More resource-intensive initiatives should be considered after production capacity, financial resources, and distribution networks have been strengthened.

The results also show that the weakest marketing element does not automatically yield the highest-priority strategy. Promotion had the lowest condition score, yet promotion and social activities ranked last because experts expected bazaars and community activities to contribute less to sales growth (3.60) and market expansion (3.40). The marketing mix scores describe current practices, whereas TOPSIS values reflect expert assessments of feasibility and impact. Promotion still requires improvement through low-cost digital channels, which interviews and previous studies identify as accessible entry points for small enterprises (Hariani et al., 2022; Widagdo et al., 2024). These findings are consistent with previous studies combining the marketing mix and TOPSIS to support MSME marketing decisions (A. A. A. Putri et al., 2025; Diniaty & Nur, 2025). This study extends that approach by linking strategic alternatives to measured marketing gaps, distinguishing feasibility from impact, and examining ranking sensitivity.

In practice, the TOPSIS ranking indicates general priorities rather than a uniform implementation sequence, because enterprise capacities and networks differ. For small enterprises, priority should be given to affordable improvements that strengthen basic business readiness. These include maintaining basic hygiene and food safety practices, improving product handling and packaging, establishing a consistent brand identity, and creating a basic digital presence through Google Maps and social media to improve business visibility. Small

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enterprises should also identify nearby SPPG units and understand their product specifications and procurement requirements before seeking institutional supply opportunities. Access to such markets should be pursued gradually, according to their production capacity and ability to meet applicable quality and safety requirements.

For the medium-sized enterprises in this study, the priority should be strengthening distribution capacity and expanding market coverage. Practical measures include developing additional distribution outlets, establishing regional distribution hubs where economically feasible, strengthening partnerships with distributors and retailers, and using online platforms to reach wider markets. Their operational capacity can also support more consistent production and distribution for institutional buyers, provided that applicable food safety, product quality, and procurement requirements are fulfilled.

Local governments, KOPTI, and relevant support agencies can facilitate these efforts through business mentoring, food safety guidance, digital marketing training, and coordination between MSMEs and potential institutional buyers. This differentiated approach allows enterprises to pursue marketing improvements according to their respective capacities and levels of business readiness.

This study has several limitations. The sample was small and only partly purposive, while market leadership was identified through an informal pre-survey. Instrument quality relied on content validity, three price items were excluded during outlier screening, and expert judgements were potentially sensitive to panel composition. Furthermore, group comparisons were descriptive, the MBG demand figure represents a simulation of potential demand, and the actual effects of implementing the proposed strategies were not measured.

CONCLUSION

The marketing conditions of the studied tempe and tofu MSMEs in Bogor were good overall, with place as the strongest marketing element and promotion as the weakest. Differences between medium-sized and small enterprises were greater than those between tempe and tofu producers. Seven alternative marketing strategies were formulated based on the marketing mix assessment and interview findings. TOPSIS ranked distribution channel expansion first (0.726), followed by pricing strategy (0.593) and strengthening institutional market access through the MBG Program (0.588). Distribution channel expansion remained the top priority across all 13 criterion-weighting scenarios. However, the leave-one-expert-out analysis showed sensitivity to panel composition, as institutional market access through MBG became the top-ranked strategy when the academic expert was excluded.

Strategies with high potential impact but lower implementation feasibility, namely market area development, brand strengthening, and product diversification, should be implemented gradually according to each enterprise's capacity. Promotion improvements should prioritise affordable digital channels. Future studies should examine the implementation and actual effects of the prioritised strategies using a larger and more diverse sample of MSMEs. Given that this study involved only eight MSMEs and five experts in Bogor, its findings should be interpreted as context-specific priorities rather than statistically generalisable conclusions. Overall, integrating marketing mix assessment with TOPSIS provides a structured approach to translating identified marketing gaps into strategic priorities for resource-constrained MSMEs.

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