Strategic Management of the Coffee Processing Business towards Sustainable Growth

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The coffee processing industry is a significant sector in Thailand's economy. This study aimed to examine the strategic management practices within the coffee processing business to promote sustainable growth, employing a structural equation model alongside a mixed-methods approach. The qualitative phase involved validating the model through in-depth interviews with nine experts and a focus group comprising 11 successful business professionals. For the quantitative phase, data were collected from 500 manufacturing enterprises using a questionnaire, followed by descriptive statistics, inferential analysis, and multivariate techniques. Findings revealed that strategic management for sustainable growth in the coffee processing business encompassed four key dimensions of importance: 1) Product (mean = 4.49), focusing on taste management; 2) Business Competition (mean = 4.49), emphasising promotion via social media; 3) Business Alliance (mean = 4.48), involving governmental tax incentives and funding; and 4) Innovation and Technology (mean = 4.44), relating to development that extends the shelf life of coffee products. Hypothesis testing indicated that businesses of comparable size attributed similar importance to these strategic management components. The structural equation model developed was found to satisfy evaluation criteria and aligned well with empirical data. The fit indices obtained were as follows: CMIN–ρ (chi-square probability) = 0.079, CMIN/DF (relative chi-square) = 1.143, GFI (goodness of fit index) = 0.960, and RMSEA (root mean square error of approximation) = 0.017.

Keywords: Strategic Management, Structural Equation Model, Thailand, Coffee Processing Business, Sustainable Growth.

Introduction

Coffee remains one of the most widely consumed beverages globally, with a consistent increase in both its consumption and the variety of coffee-related products (Kekes et al., 2025; Peluso, 2023; Zimmermann, 2023). Between 2019 and 2023, global coffee consumption rose by an average of 1.36%, with Africa exhibiting the highest growth rate at 2.86% (Proença et al., 2022; Serna-Jiménez et al., 2022). Thailand has mirrored this upward trend, reinforcing its role in the expansion of the international coffee processing sector (Poltronieri & Rossi, 2016). As reported in the Commodity Trade report, Thailand holds the position of the 24th largest global exporter of coffee and related products, with an annual average export value of 125.89 million US dollars. Within ASEAN, Thailand ranks fourth, following Vietnam, Indonesia, and Malaysia. Consequently, the coffee processing sector has emerged as a vital component of the Thai economy. Predominantly, the industry in Thailand focuses on primary processing, wherein raw coffee beans are transformed into semi-finished coffee products. Although raw coffee bean production has declined domestically during the period from 2019 to 2023, the consumption of these beans within the country has shown a steady rise.

Globally, the agricultural sector places considerable reliance on coffee processing, which encompasses core activities such as cultivation, processing, packaging, and distribution (Góngora et al., 2023). Rising consumer demand for premium coffee products necessitates that processing enterprises maintain competitiveness through environmentally and socially responsible practices (Lee et al., 2023). To ensure long-term viability, companies must adopt strategic planning, sound decision-making processes, and efficient allocation of resources. This study explores critical strategic management practices essential for the sustainable advancement of coffee processing firms, aiming to contribute to economic progress while upholding social and environmental responsibilities (Samper & Quiñones-Ruiz, 2017).

In Thailand, apart from the challenge posed by the limited supply of raw coffee beans, the industry faces additional obstacles related to both domestic demand and export activities. Key issues include the relatively high cost of bean production compared to other nations, as well as the need to elevate product quality and industry standards, enhance technological capabilities, promote innovation in coffee product development, and improve workforce skills (Bilen et al., 2022; Rebollo-Hernanz et al., 2023). These aspects are integral to the sector's progression (Li, Zhao, & Cao, 2023). Numerous initiatives have been implemented to raise production efficiency and improve product quality while safeguarding the environment (Tsai, Lee, & Huang, 2025). These strategies also prioritise value-added processing, the formulation of effective marketing approaches, and optimised resource management to secure sustainable development for Thailand's coffee processing industry (Malarat et al., 2023). This research seeks to examine the strategic management approaches utilised within Thailand's coffee processing sector, with the objective of formulating actionable recommendations to strengthen industry potential, enhance GDP, boost international competitiveness, and realise sustainable national development. The analysis focuses on strategic frameworks, prevailing industry challenges, and avenues for growth, with

the intent of delivering practical insights for entrepreneurs, policymakers, and sectoral stakeholders.

Research Objectives

The objectives of this research were as follows:
1. To investigate the organisational structure and operational characteristics of enterprises within the coffee processing sector.
2. To analyse the components of strategic management employed by coffee processing businesses in pursuit of sustainable development.
3. To construct a structural equation model representing strategic management approaches that support sustainable growth in the coffee processing industry.

Literature Review

According to the National Coffee Development Action Plan 2022–2031, the overarching objective is to broaden the prospects for coffee development along the entire value chain, thereby fostering sustainability while progressively enhancing the potential for environmentally responsible growth. The key missions identified in this plan include: (1) conducting research and innovation to support the development of modernised production management systems; (2) improving the efficiency of coffee production systems to align with international benchmarks; (3) establishing collaborative networks among government bodies, academic institutions, farmer associations, and entrepreneurs; (4) raising quality standards and strengthening the distinctiveness of Thai coffee; and (5) positioning Thailand as a central hub for coffee trade within ASEAN and the wider Asian region.

Government agencies such as the Ministry of Industry (MIND) and the Ministry of Agriculture and Cooperatives (MOAC) are required to collaborate across ministerial lines, including with international, private, and governmental entities, to foster technological advancement and human resource development that can be practically applied by local farmers. The term "coffee processing business" encompasses all operations involving the sourcing, production, marketing, sales, distribution, and development of products and services related to coffee and tea. This includes various packaging formats and forms such as roasted and ground coffee, instant coffee, tea, caffeine-related products, decaffeinated beverages, and equipment for coffee preparation and maintenance. It is important to note that this definition explicitly excludes activities concerning the production, distribution, and marketing of fruit juices, water, or flavourings unrelated to coffee or tea, except when used as components in coffee or tea-based beverages.

Albarracin et al. (2024) noted that coffee consumption has experienced a consistent increase over time. Coffee is recognised as the most widely traded agricultural commodity globally (Irawan, Rabemanolontsoa, & McLellan, 2024). In 2010, production took place in approximately 70 countries, with the industry providing employment for around 26 million individuals across 52 coffee-producing nations. During the 2009–2010 period, exports amounted to 93.4 million bags with an estimated value of 15.4 billion US dollars. Research by da Cruz

Correia et al. (2024) found that consuming a single cup of coffee daily contributes small amounts of essential minerals such as calcium, iron, magnesium, and manganese to the diet. Coffee is produced from the roasted seeds of the coffee berry, derived from the Coffea genus, which is indigenous to Africa and the surrounding Indian Ocean islands including Madagascar, Comoros, Mauritius, and Réunion (Bamenga Bopoko et al., 2025).

Generally, the establishment of a new coffee business involves several phases: (1) securing necessary resources to launch operations; (2) initiating and managing the business, followed by its expansion; and (3) ultimately gaining returns from the venture. This developmental process encompasses the conceptualisation and foundational activities required to create a new enterprise, which may include organisational establishment and early operational efforts. Maradiaga-López et al. (2025) observed that fulfilling fundamental sustainability requirements poses a significant managerial challenge for organisations operating in high-risk environments. Addressing these challenges requires identifying essential tools and resources, as well as introducing changes within managerial systems. Corporate social responsibility reflects the interaction between businesses, society, and governments, especially in the context of evolving global development dynamics. Haryono et al. (2024) found that the integration of sustainable practices into corporate operations is directly associated with the enhancement of competitive advantage. Such advantage enables firms to offer unique products and generate substantial profit margins. Consequently, businesses are encouraged to pursue sustainable innovation, develop modern technologies, and manage their resources strategically.

Favaro et al. (2020) argued that practitioners, policymakers, and academics must understand how sustainability-related strategies and innovations affect the overall performance of businesses. Practitioners require knowledge concerning the financial outcomes of sustainable operational practices, while policymakers need insights to develop effective frameworks that align with business behaviour and value creation mechanisms. Though there is growing evidence supporting a positive correlation between sustainability performance and corporate outcomes, debates persist regarding the specific conditions and terminologies through which this relationship is articulated.

This study centres on enhancing firm-level competitiveness through sustainable strategies by examining the interactions among sustainability initiatives, social responsibility, and environmental innovation within manufacturing firms. It also investigates how these innovations and technological advancements influence overall firm performance, which is defined in terms of value creation, cost-efficiency, and risk mitigation. Drawing on the literature, relevant theories, and empirical findings, the researcher has synthesised a strategic management model for sustainable growth in the coffee processing industry, categorised into four dimensions. The Product component pertains to the output derived from processed coffee beans, including roasted, instant, and ready-to-drink variants, along with packaging designed to promote industry sustainability. Innovation and Technology involve improved processing methods that enhance convenience,

precision, speed, and safety, while simultaneously reducing costs and leveraging modern, high-value technologies to optimise operational effectiveness. Business Competition reflects a firm's capability to contend with similar companies, new market entrants, and bargaining power dynamics involving both suppliers and customers, which is vital for securing a substantial market share. Business Alliance denotes cooperative relationships among multiple stakeholders, including firms and consumers within the coffee processing sector, aimed at achieving mutual business success.

Research Hypotheses

H1: The Product component directly influences the Innovation and Technology component.

H2: The Product component directly influences the Business Alliance.

H3: The Product component directly influences the Business Competition.

H4: The Business Alliance component's direct influence on Innovation and Technology.

H5: The Business Alliance component direct influence on the Business Competition.

H6: The importance of strategic management in the coffee processing business for sustainable growth differs when classified by business size.

Conceptual Framework

The variables employed in the quantitative aspect of this study are categorised into two principal types:

Independent Variables: The classification of coffee processing business operators or executives is based on the scale of their organisations. Two categories are identified: medium and small-sized enterprises, defined as those with registered capital not exceeding 100,000,000 baht, and large enterprises, with registered capital exceeding this amount.

Dependent Variables: These pertain to the structure and characteristics of operational activities within the coffee processing sector, specifically focusing on strategic management aimed at sustainable growth. The data collection tools used to assess these variables comprise two formats: (1) a checklist and (2) a rating scale. The checklist is used to assess the strategic management practices within coffee processing businesses, whereas the rating scale is utilised to evaluate strategic management effectiveness in promoting sustainable growth.

The rating scale is further divided into two types of variables:

1. Observed Variables: These represent the data directly collected from respondents regarding the strategic management practices adopted by coffee processing businesses in pursuit of sustainable growth.

2. Latent Variables: These are variables inferred from the observed data. Latent variables are subdivided into:

- Exogenous Latent Variables: This category includes the product component, representing the tangible outputs of coffee processing.

- Endogenous Latent Variables: These consist of innovation and technology, business competition, and business alliance components. Each reflects internal factors that are influenced by and respond to the exogenous variables, contributing to the overall

strategic management for sustainable development within the coffee processing industry.

Methodology

Research Tools

The research instruments employed in this study comprise the following elements: (1) a structured interview, for which the researcher developed an interview guide based on four key components—Product, Innovation and Technology, Business Competition, and Business Alliance; (2) a questionnaire divided into four sections: Part 1 consists of a checklist containing five items alongside one open-ended question; Part 2 includes a checklist with 20 items; Part 3 employs a five-point Likert scale for rating responses; and Part 4 comprises five open-ended questions; (3) focus group discussions.

Data Collection

For the in-depth interviews, the researcher secured a letter of introduction from the Faculty of Business Administration, Doctor of Business Administration Program, Industrial Business Administration, at King Mongkut's University of Technology North Bangkok. Subsequently, the research team reached out to selected experts to request their cooperation in providing pertinent information. Arrangements were made to schedule the interviews regarding date, time, and venue, with the sessions conducted according to the predetermined framework. Throughout the interview process, data were continuously recorded. Following completion, the researcher transcribed all conversations verbatim, systematically analysed and interpreted the experts' viewpoints, categorised and summarised the findings, which were then utilised to design instruments for subsequent quantitative analysis.

In the quantitative component utilising survey methods, the researchers obtained contact details of executives or representatives from coffee processing businesses through the Department of Business Development database. Introductory letters were issued, and the sample population was approached to secure their participation in completing the questionnaires. Interviews employing the questionnaire were arranged, and where face-to-face meetings were unfeasible, the questionnaires were distributed and collected via postal or electronic channels. Regarding the focus group discussions, a discussion record form was employed while a moderator introduced topics intended to stimulate extensive brainstorming and broaden participants' perspectives. The procedure involved the researcher acquiring an introductory letter, contacting experts to solicit their cooperation, drafting discussion topics and presenting them for expert review, and conducting the group discussions at the specified time and place. Data were recorded throughout the sessions, and the insights gained from the experts were collected for further detailed analysis.

Data Analysis

The methods employed for data analysis in this study were as follows: (1) Content analysis was applied to data obtained from in-depth interviews, which were subsequently synthesised to illustrate the strategic management practices

of coffee processing businesses aimed at sustainable growth within each identified component. (2) Descriptive statistics were utilised to analyse checklist questionnaire data by calculating frequencies and presenting them as percentages. For the rating scale data, the mean values and standard deviations (S.D.) were computed. Content analysis was also used to evaluate responses to open-ended questions, with frequencies summarised accordingly. (3) Inferential statistics were applied to assess the relationships between variable pairs associated with the strategic management of coffee processing enterprises for sustainable growth. Bivariate correlation analyses were conducted with significance thresholds set at 0.001, 0.01, and 0.05. To examine the association between the operational framework and characteristics of industrial businesses and the strategic management of coffee processing businesses for sustainable growth, Pearson's Chi-square test was employed, using a significance level of 0.05. Differences in strategic management practices based on business size were evaluated using the t-test, with significance also set at 0.05. (4) Multivariate statistical methods were used to perform structural equation modelling (SEM) analyses. This included developing and analysing the SEM for strategic management within coffee processing businesses targeting sustainable growth. (5) Data derived from group discussions were analysed through content analysis, with opinions and recommendations summarised.

The AMOS software (Advanced Statistical Analysis Program) was utilised to obtain relevant statistical information and to interpret hypothesis testing outcomes. The model incorporated a "Latent Variable Adjustment" component to ensure thoroughness at every research stage. Model consistency was iteratively assessed until all components or latent variables aligned with empirical data in accordance with predetermined criteria, based on "Observed Variables" collected through a five-level rating scale questionnaire. Model refinement, in line with empirical evidence, required adherence to specific evaluation criteria. Arbuckle's four criteria for model assessment, which are detailed in Table 1, were used as the basis for evaluation.

Table 1: Criteria for Evaluating the Consistency of the Structural Equation Model.

Evaluation of Model Consistency	Criteria
1. CMIN-p (Chi-Square Probability)	Greater than 0.05
2. CMIN/DF (Relative Chi-Square)	Less than 2.00
3. GFI (Goodness of Fit Index)	Greater than 0.09
4. RMSEA (Root Mean Square Error of Approximation)	Less than 0.08

Results

Qualitative Research Results Achieved Via In-Depth Interview Techniques

The findings presented in this section were obtained through content analysis of in-depth interviews and encapsulate the experts' perspectives regarding the structural equation model for trade secret protection guidelines within the industrial business sector. The analysis of trade secret protection strategies, based on expert interviews, identified four key components: (1) Data Management, (2) Punishment, (3) Workforce, and (4) Internal Process.

Results of Data Analysis on the General Status of Coffee Processing Business Organizations

The results in this section indicate that limited companies represented the most frequent form of business establishment, comprising 39.00% of the sample, followed by public limited companies at 32.60%. The predominant period of operation was less than five years, accounting for 66.80%, with the next largest group operating between six and ten years, at 26.80%. Registered capital was evenly distributed, with medium and small enterprises constituting 50.00%, matched by large enterprises at 50.00%. The majority of businesses reported no joint investment, at 80.40%, whereas foreign joint investments accounted for 19.60%. Among the foreign joint ventures, those with a 21–40% ownership stake were the most common, representing 48.00%, followed by ventures with less than 20% ownership at 37.70%. Regarding corporate standards, the largest segment of businesses had not obtained any certification, at 48.40%, while 28.40% had acquired quality management standards. The duration of operation in the coffee processing industry was most commonly under three years, at 35.80%, followed closely by those operating for three to five years, at 34.80%.

Results of Analysis of Data on the Structure and General Operating Characteristics of Coffee Processing Businesses

The most frequently processed coffee types were identified as Original Series coffee, accounting for 35.40%, followed by Roast and Ground coffee at 28.00%, and Instant coffee at 23.40%. The leading sales channel was direct sales by the company, comprising 43.60%, with sales via agents representing 27.40%. The primary source of raw coffee bean procurement was domestic, making up 55.60%, followed by a combination of domestic and foreign sources at 40.80%. Similarly, machinery procurement was predominantly domestic at 48.80%, with a combined domestic and foreign source accounting for 38.40%. Among internal factors affecting cost reduction, capital had the greatest influence at 31.00%, succeeded by technology and innovation at 26.80%.

Externally, the economy was the most significant factor impacting cost reduction at 37.40%, followed by competitor activity at 31.00%. The prevalent coffee processing method involved a combination of manual labour and machinery, constituting 67.60%, while exclusive use of manual labour was reported by 20.00%. The principal source of operational funding was own capital at 36.80%, closely followed by loans from banks or financial institutions at 36.20%. Regarding product branding, a single brand was most common at 48.60%, with unbranded products representing 31.60%. The most typical approach to coffee processing was in-house processing at 38.20%, followed by a mix of in-house processing and outsourcing to external processors at

31.60%.

In response to economic fluctuations, the most prevalent strategy was constant preparedness, accounting for 56.60%, followed by engaging skilled consultants for advice at 23.40%. The foremost focus of innovation was on production process innovation at 45.20%, with product and service innovation second at 38.00%. Competitive strategies most commonly involved offering appropriate pricing (39.00%) and providing unique products to customers (30.80%). Organisations primarily targeted domestic customers (71.60%), followed by international customers, especially within Asia (19.40%). The preferred method for managing business innovation was through internal development of innovations (59.60%), followed by collaboration with external entities or educational institutions (23.20%). When faced with rising raw material prices, the most frequent response was to adjust processing prices accordingly (36.80%), followed by enhancing coffee processing efficiency to reduce costs (30.80%). Organisations identified product quality as their primary strength (59.80%), followed by product price (22.40%). The key weaknesses were cooperation with government agencies (38.60%) and product pricing (27.00%). The most significant challenges within the coffee processing sector were related to coffee bean raw materials (30.40%) and financial or capital constraints (25.80%). Regarding corporate social responsibility (CSR), the majority reported no CSR activities (40.60%), followed by inconsistent CSR initiatives (35.80%).

Structure and General Operating Characteristics of Coffee Processing Businesses, Classified Based on the Size of the Industrial Business

The results indicate that the type of coffee processing differed according to the size of the industrial business, with statistical significance at the 0.05 level (p-value = 0.00). Specifically, for medium and small businesses, the predominant coffee processing type was ordinary fresh coffee processing (Original Series Coffee), representing 44.80%, followed by roasted and ground coffee processing (Roast and Ground Coffee) at 28.40%. Conversely, large businesses primarily processed instant coffee (Instant Coffee) at 31.20%, with roasted and ground coffee processing second at 27.60%. In terms of sales channels, medium and small enterprises most commonly utilised direct sales by the company at 50.80%, followed by online sales at 25.60%. Large enterprises preferred sales through agents, accounting for 39.20%, with direct company sales at 36.40%. Regarding the sources of coffee bean raw materials, medium and small businesses relied chiefly on domestic sources (71.20%), followed by a combination of domestic and foreign supplies at 28.40%. Large businesses sourced primarily from both domestic and foreign suppliers (53.20%), with domestic sources second at 40.00%.

Machinery procurement for medium and small businesses was predominantly domestic at 67.50%, followed by a mix of domestic and foreign sources at 26.00%. For large businesses, the main source was a combination of domestic and foreign suppliers (50.80%), followed by domestic procurement at 30.00%. Among internal factors influencing cost reduction, capital was most impactful for medium and small enterprises at 36.80%, with personnel second at 21.20%. In contrast, technology and innovation were the foremost internal factors for large enterprises, at 34.40%, followed by capital at 25.20%. External factors affecting cost reduction were independent of business size, with the economy exerting the greatest influence at 37.40%, followed by competitors at 31.00%. The most common coffee processing method for medium and small enterprises was the combination of human labour and machinery at 73.20%, with exclusive human labour second at 23.20%. For large businesses, the predominant method was also a combination of human labour and machinery, at 62.00%, followed by exclusive use of machinery at 20.80%. The primary funding source for medium and small businesses was their own capital at 50.40%, followed by bank or financial institution loans at 32.40%. Large enterprises most often relied on loans from financial institutions (40.00%), followed by capital raised from stakeholders (36.80%).

In terms of product branding, most coffee processing businesses offered single-brand products, at 50.40%, followed by unbranded products at 39.20%. Large businesses also predominantly used single brands (46.80%), followed by multiple brands (29.20%). For medium and small enterprises, in-house coffee processing was most common at 46.80%, followed by hiring external coffee processors at 32.00%. Large businesses typically combined in-house processing with external processors at 42.00%, with in-house processing alone second at 29.60%. The dominant strategy for managing economic volatility among all businesses was maintaining constant preparedness, at 68.00%, followed by accurate risk assessment at 16.80%. Among large businesses, preparedness remained most common at 45.20%, with engagement of expert consultants second at 33.20%. Regarding innovation, product and service innovation was the priority for most businesses at 44.80%, followed by production process innovation at 42.00%. Large businesses emphasised production process innovation most (48.40%), then product and service innovation (31.20%). The most frequently employed competitive strategy was offering appropriate product prices (49.20%), followed by providing unique products (30.00%). Large businesses focused on adopting advanced and efficient coffee processing technology (39.20%), with unique product offerings next (31.60%).

The customer groups most prioritised by businesses were domestic customers (87.20%), followed by international customers, particularly within Asia (6.80%). For large businesses, domestic customers were also the primary group (56.00%), followed by international customers in Asia (32.00%). The preferred approach to managing business innovation involved developing innovations internally (72.00%), with collaboration with external organisations or educational institutions next (16.00%). Large businesses followed a similar pattern, with 47.20% developing internally and 30.40% collaborating externally. To address fluctuations in raw material prices, the most common strategy was adjusting processing prices to reflect costs (41.20%), followed by enhancing coffee processing methods to reduce costs (28.40%). For large businesses,

improving processing efficiency was most common (33.20%), followed by price adjustment (32.40%). Product quality was identified as the organisation's strongest attribute (61.20%), followed by product price (26.40%). Among large enterprises, product quality was also foremost (58.40%), with organisational reputation second (21.20%). The principal organisational weakness for all businesses was limited cooperation with government, at 44.40%, followed by organisational reputation at 26.80%. Large businesses similarly identified cooperation with government as a weakness (32.80%), with product price next (32.00%). Problems encountered in coffee processing businesses did not differ significantly by business size, confirmed at the 0.05 significance level. The main issues were related to coffee bean raw materials (30.40%), followed by financial and capital constraints (25.80%). Regarding CSR, most businesses reported not organising any CSR activities (52.00%), followed by inconsistent CSR activities (34.40%). Large businesses most commonly organised CSR activities inconsistently each year (37.20%), followed by consistent annual CSR activities (33.60%).

Analysis of the Importance of Strategic Management Elements in the Coffee Processing Business for Sustainable Growth

The overall findings revealed a high level of importance attributed to the strategic management components within the coffee processing industry in relation to sustainable growth, with a mean score of 4.48. The components were ranked as follows: first, the Product aspect was deemed highly important, exhibiting a mean score of 4.49 (S.D. = 0.37); second, the Business Competition aspect also held high importance, with a mean of 4.49 (S.D. = 0.43); third, the Business Alliance aspect was similarly regarded as highly important, with a mean value of 4.48; and fourth, Innovation and Technology were considered highly important, reflected by a mean score of 4.44.

Importance of Strategic Management Elements in the Coffee Processing Business for Sustainable Growth, Classified by the Size of the Industrial Business

When segmented into four aspects, Product, Innovation and Technology, Business Competition, and Business Alliance SMEs exhibited a high overall importance level for the strategic management of coffee processing businesses aimed at sustainable growth, with an average score of 4.31. The ranking of these components was as follows: (1) Product, with a high importance level and an average score of 4.35; (2) Business Competition, also highly important with an average of 4.34; (3) Business Alliance, similarly rated highly with an average of 4.32; and (4) Innovation and Technology, which held a high importance level with an average score of 4.25. In contrast, large-sized businesses demonstrated the highest overall importance level, with an average score of 4.64. The strategic management components for these businesses were ranked as follows: (1) Business Competition, which held the highest level of importance with an average score of 4.65; (2) Product, also at the highest importance level with an average of 4.64 (S.D. = 0.31); (3) Business Alliance, rated highly with an average of 4.64 (S.D. = 0.37); and (4) Innovation and Technology, also considered highly important with an average score of 4.63 (see Table 2).

Table 2: Strategic Management of Coffee Processing Businesses toward Sustainable Growth, Classified by the Size of the Industrial Business

Strategic Management Elements of Coffee Processing Businesses for Sustainable Growth	Medium and Small Businesses			Large Business		
	$\overline{X}$	S.D.	Importance Level	$\overline{X}$	S.D.	Importance Level
The Overall Importance of the Components	4.31	0.40	High	4.64	0.32	Highest
1. Product	4.35	0.37	High	4.64	0.31	Highest
2. Business Competition	4.34	0.45	High	4.65	0.34	Highest
3. Business Alliance	4.32	0.49	High	4.64	0.37	Highest
4. Innovation and Technology	4.25	0.43	High	4.63	0.34	Highest

Comparison of the Differences in the Level of Importance for Strategic Management Elements in Coffee Processing Businesses towards Sustainable Growth, Classified by the Size of the Industrial Business

The findings indicate that the overall importance level of strategic management components in coffee processing businesses for sustainable growth varies significantly according to business size, with statistical significance at the 0.05 level Table 3. Large businesses attribute greater importance to these strategic management components for sustainable growth compared to medium and small businesses.

Table 3: Comparison of Strategic Management Importance by Business Size.

Strategic Management Elements of Coffee Processing Businesses for Sustainable Growth	T-Value	P-Value
The Overall Importance of the Components	-10.16	0.00*
1. Product	-9.70	0.01*
2. Innovation and Technology	-10.89	0.00*
3. Business Competition	-8.66	0.00*
4. Business Alliance	-8.41	0.00*

*Statistically Significant at the 0.05 level.

The Results of the Hypothesis Tests Found the Following Results

The level of importance attributed to strategic management components in coffee processing businesses towards

sustainable growth varies according to business size. The hypothesis test yielded an overall p-value of 0.00*, indicating a statistically significant difference at the 0.05 level, in line with the research hypothesis. Specifically, large businesses assign greater importance to these strategic management components for sustainable growth compared to medium and small businesses.

Results of the Data Analysis on Opinions and Suggestions

Strategic management guidelines for coffee processing businesses aiming to achieve sustainable growth include the following:
1. Continuously develop coffee products that align with consumer preferences and market requirements.
2. Establish an online digital communication strategy to effectively engage target customer segments.
3. Ensure that the government provides consistent and substantial support.

The benefits of applying strategic management for sustainable growth in coffee processing businesses are:
1. Facilitating long-term growth and enhancing organisational stability.
2. Achieving cost reductions over an extended period.
3. Enabling sustainable and efficient improvements in the quality of coffee products.

The challenges and barriers influencing strategic management towards sustainable growth are identified as:
1. Deficiencies in knowledge and understanding of management principles.
2. Economic volatility and environmental constraints.
3. Limited and inconsistent governmental support.

To adapt and promote sustainable growth, coffee processing businesses should:
1. Undertake ongoing research and product development to meet evolving market demands.
2. Implement pricing strategies that correspond appropriately to product quality and volume, ensuring value for money.
3. Encourage and support farmers in cultivating coffee beans in quantities that correspond with market needs.

Analysis of the Structural Equation Model Before Model Improvement

The results of the structural equation modelling analysis concerning the strategic management of the coffee processing business for sustainable growth, shown in both Standardized Estimate and Unstandardized Estimate modes prior to model refinement, are illustrated in Figures 1 and 2.
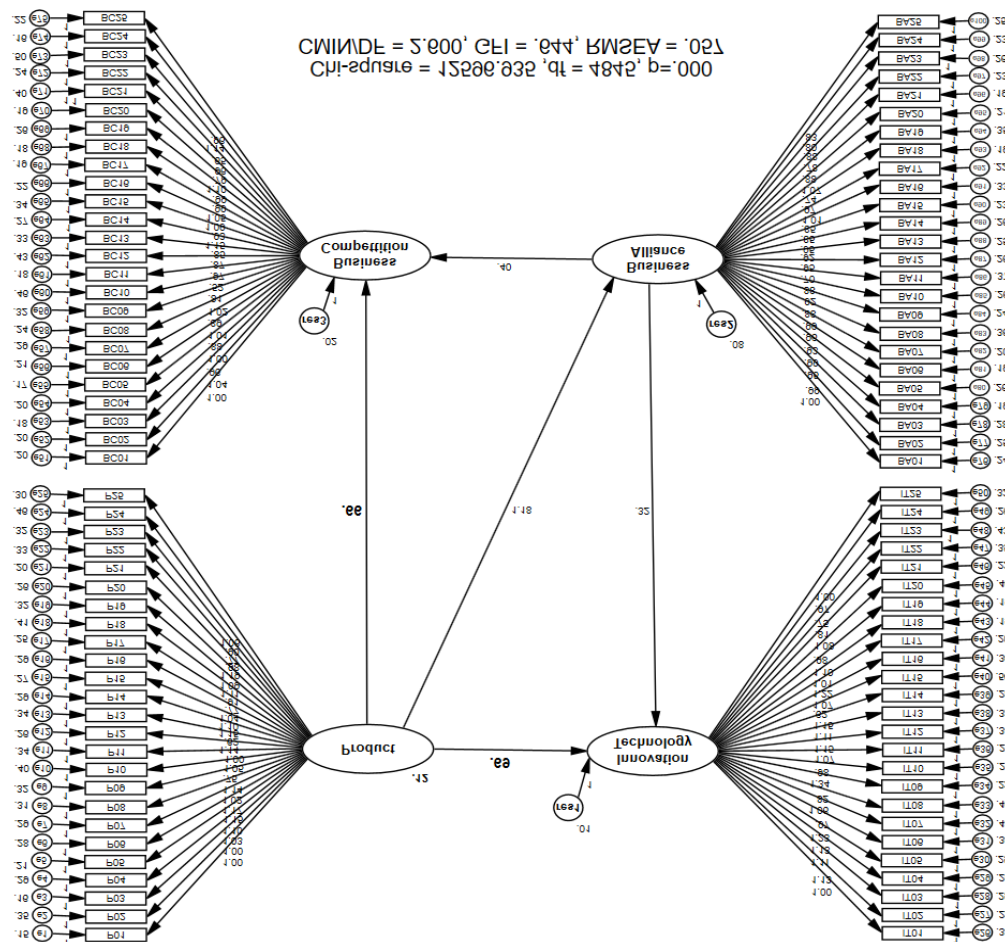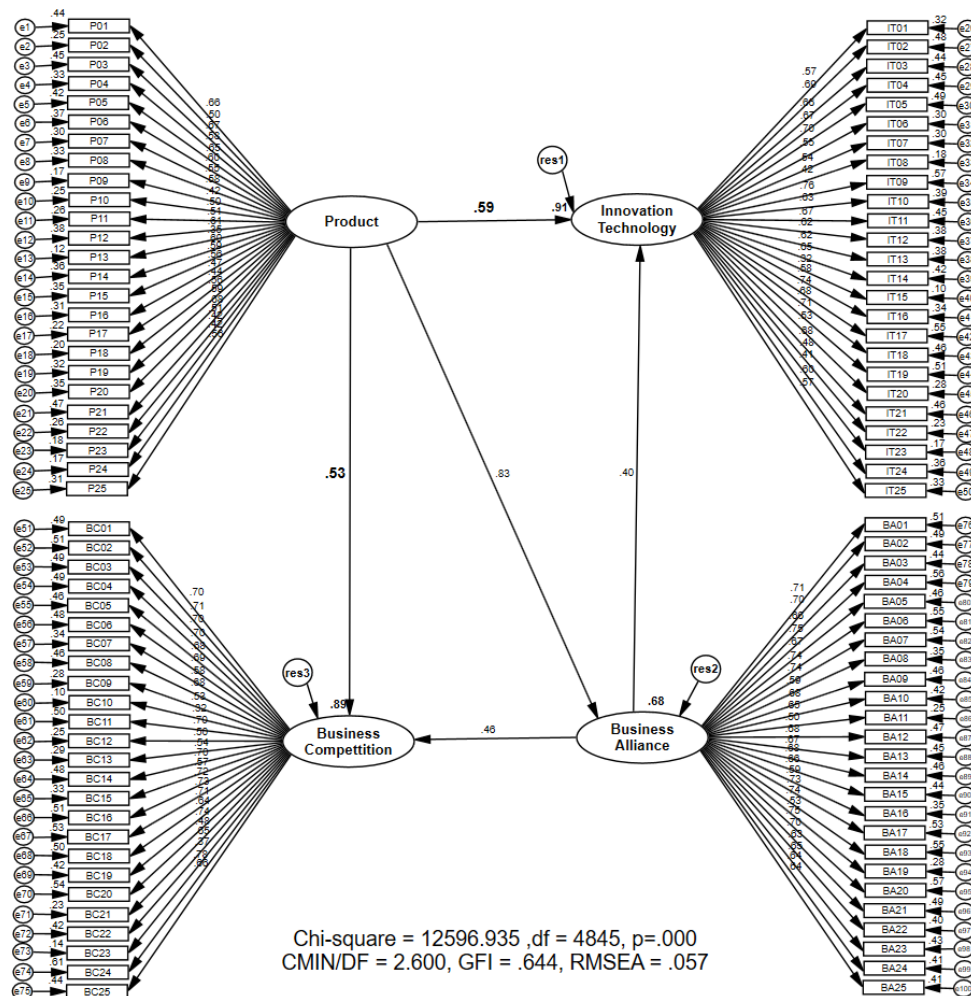

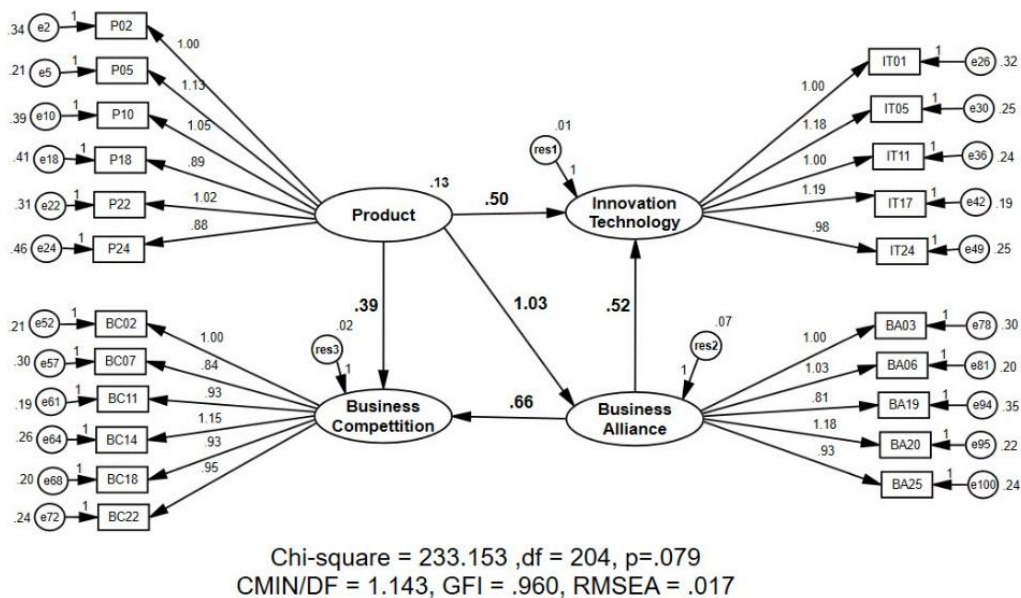**Figure 1:** Structural Equation Model in Unstandardized Estimate Mode, Before Model Improvement.

Figure 2: Structural Equation Model in Standardized Estimate Mode Before Model Improvement.

Results From the Structural Equation Model Analysis after Model Improvement

The findings from the structural equation model analysis regarding the strategic management of the coffee processing business for sustainable growth, displayed in both the Standardized Estimate and Unstandardized Estimate modes following model refinement, are shown in Figures 3 and 4.

Figure 3: Structural Equation Model in the Unstandardized Estimate Mode after Model Improvement.

Chi-square = 233.153 ,df = 204, p=.079
CMIN/DF = 1.143, GFI = .960, RMSEA = .017
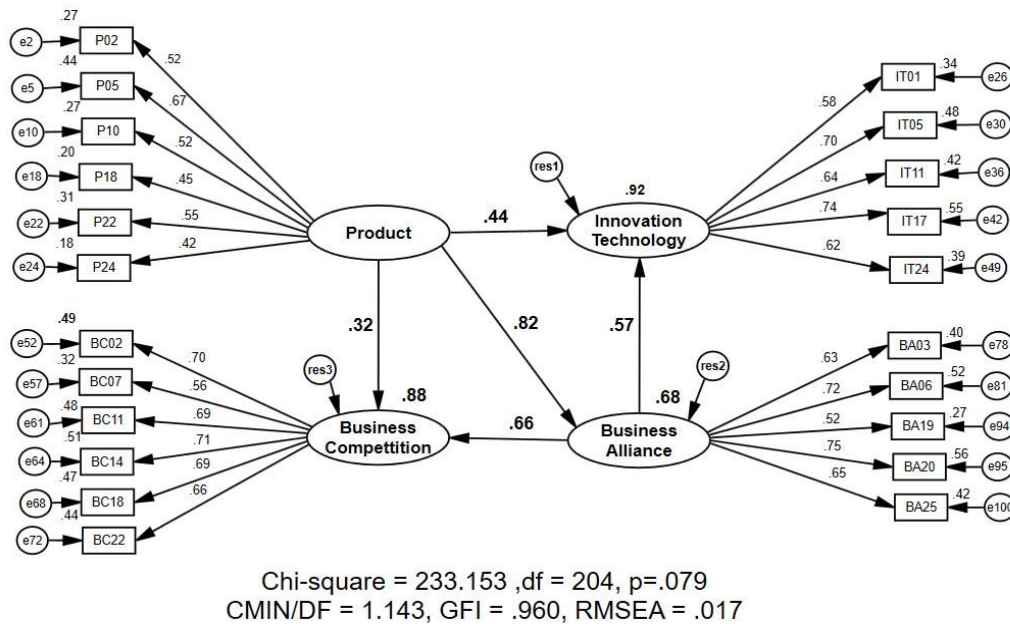
Figure 4: The Structural Equation Model Improvement in Standardized Estimate Mode.

Figures 3 and 4 illustrate the Structural Equation Model of strategic management components for coffee processing businesses after model enhancement, comprising four latent variables. These include the exogenous latent variable, Product component, and the endogenous latent variables: Business Alliance, Innovation and Technology, and Business Competition. The Product component was found to exert a direct effect on the Innovation and Technology component, with a standardized regression weight of 0.44, statistically significant at the 0.001 level. The analysis indicated a multiple correlation coefficient (r^2) of 0.92 and a variance of 0.01. It also directly influenced the Business Alliance, with a standardized regression weight of 0.82, significant at 0.001, accompanied by a multiple correlation coefficient (r^2) of 0.68 and a variance of 0.07. Additionally, the Product component directly affected Business Competition, with a standardized regression weight of 0.32, significant at 0.001, alongside a multiple correlation coefficient (r^2) of 0.88 and a variance of 0.02. The Business Alliance demonstrated a direct impact on the Innovation and Technology component, with a standardized regression weight of 0.57, significant at 0.001, a multiple correlation coefficient (r^2) of 0.68, and a variance of 0.07. It also

directly influenced Business Competition, with a standardized regression weight of 0.66, significant at 0.001, with a multiple correlation coefficient (r^2) of 0.88 and a variance of 0.02.

Results of Evaluating the Consistency of the Structural Equation Model Before and After Model Improvement

The RMSEA value was 0.057, which satisfies the criteria for evaluation with empirical data. However, the CMIN–ρ was 0.000, the CMIN/DF was 2.600, and the GFI was 0.644, all of which failed to meet the acceptable criteria for empirical data assessment. Consequently, the researcher refined the model by examining the "Modification Indices" values. Following these improvements, the CMIN–ρ increased to 0.079, exceeding the 0.05 threshold; the CMIN/DF decreased to 1.143, below the acceptable limit of 2; the GFI rose to 0.960, surpassing the minimum criterion of 0.90; and the RMSEA reduced to 0.017, which is under the 0.08 benchmark. These results indicate that all four statistical indices now meet the required criteria, demonstrating that the revised structural equation model aligns well with the empirical data Table 4.

Table 4: Statistical Values Assessing the Goodness of Fit of the Structural Equation Model, Comparing Before and After Model Improvement.

Statistics	Consideration Criteria	Before Improvement	After Improvement
Chi-Square Probability Level (CMIN–ρ)	< 0.05	0.000	0.079
Relative Chi-Squared (CMIN/DF)	> 2.00	2.600	1.143
Goodness of Fit Index (GFI)	< 0.90	0.644	0.960
Root Mean Square Index of Estimation Error (RMSEA)	> 0.08	0.057	0.017

The Hypothesis Testing Results Analyse the Causal Relationships Between Latent Variables

H1: The hypothesis testing results indicate a strong influence of Product components on Innovation and Technology, with a

standardized regression weight of 0.44 at a significance level of 0.001, supporting the research hypothesis.

H2: Product components directly affect Business Alliance. The hypothesis test reveals a statistically significant impact of Product components on Business Alliance, with

a standardized regression weight of 0.82 at a significance level of 0.001, confirming the research hypothesis.

H3: the hypothesis testing results show a significant influence of Product components on Business Competition at a significance level of 0.001, with a standardized regression weight of 0.32, as hypothesized.

H4: the hypothesis testing findings demonstrate a significant impact of Business Alliance on the Innovation and Technology component at a significance level of 0.001, with a standardized regression weight of 0.57, supporting the hypothesis.

H5: The hypothesis testing results indicate a significant influence of Business Alliance on Business Competition at a significance level of 0.001, with a standardized regression weight of 0.66, as hypothesized.

Overall, Direct, and Indirect Influences in the Structural Equation Model Conducted by the Standardized Estimate Model After Improvement

The Product component exerted the greatest overall influence, affecting the Innovation and Technology component with a total standardized regression weight of 0.90 (0.44 + 0.46). This effect comprised: 1) a direct influence of 0.44 from the Product component to Innovation and Technology, and 2) an indirect influence through the Product component's impact on the Business Alliance component at 0.82, which subsequently influenced Innovation and Technology at 0.57 (calculated as $0.82 \times 0.57 = 0.46$), as detailed in Table 5.

Table 5: Overall, Direct and Indirect Influences in the Structural Equation Model Based on the Standardized Estimate Model After Improvement.

Component	Product	Business Alliance	Business Competition	Innovation and Technology
Business Alliance	0.82	0.00	0.00	0.00
Business Competition	0.86	0.66	0.00	0.00
Innovation and Technology	0.90	0.57	0.00	0.00

Analysis of the Relationship Between Strategic Management Variables After Model Improvement

The analysis revealed that, following model improvement, the structural equation model for strategic management in coffee processing businesses towards sustainable growth encompassed 231 variable pairs, all demonstrating statistical significance at the 0.001 level. The final variable pair involved creating unique processed coffee products that are difficult to replicate (P10) and the capability to discontinue coffee products that fail to meet customer requirements for business growth (P24), exhibiting a correlation coefficient of 0.172. To validate the structural equation model, the researcher consulted experts engaged in strategic management within the coffee processing sector using a focus group discussion approach. The model received unanimous approval from all participants.

Discussion and Conclusion

The research findings revealed that the product component received the highest average value, underscoring its critical role in the strategic management of coffee processing businesses aimed at sustainable growth. Challenges affecting product management include waste control and preserving freshness prior to consumer delivery. Four key factors contribute to product success: efficiency, quality, innovation, and consumer responsibility (Hung Anh et al., 2019). To secure a competitive edge, particularly regarding operational efficiency and entrepreneurial production structures, it is vital to evaluate how internal production factors interact with external influences (Gil-Ramírez et al., 2024). External factors such as product adaptation for export, export activities, and related knowledge and skills demonstrate that managers with extensive export knowledge can leverage coffee adaptation strategies to enhance export potential, focusing on branding, packaging, quality, and coffee characteristics (Djufry, Wulandari, & Villano, 2022).

Important individual components for strategic management include taste control and ensuring processed coffee products retain freshness until reaching consumers, reflecting customer demand for consistent, high-quality coffee. Efficient waste management and product handling are essential, as consumer preference primarily centres on coffee taste. Maintaining consistent, superior product quality is paramount for success. Unique flavours from coffee trees cultivated in optimal climates result in high-quality beans, contributing to broad recognition and acceptance, which in turn fosters satisfaction with both products and services. This sector has also benefited from strong, ongoing support from government and private bodies (Trollman et al., 2022). High-quality products with distinctive flavours support effective processing and added value.

Hypothesis testing demonstrated that the Product component directly influences the Business Alliance component, exhibiting the greatest overall effect with a standardized regression weight of 0.82. Empirical data suggest that product attributes affect business partners, who subsequently impact competitive advantage (Ho et al., 2024). Strategic alliances are analysed by exploring how collaboration affects competition between partners, incorporating elements such as partner learning and social network theories. This analysis reveals how different mixes of exploratory and exploitative alliances influence intra-company competition. Further hypothesis testing indicated that the Product component affects the Innovation and Technology component, with the highest overall influence reflected by a standardized regression weight of 0.90. This finding highlights products as a crucial driver of innovation and technology according to empirical evidence. Bojórquez-Quintal et al. (2024) showed that innovation and technology are fundamental to company performance, with innovation capability notably enhancing product and operational efficiency.

While innovation capability does not have a direct effect on financial performance, it indirectly influences overall

outcomes and offers opportunities to improve efficiency (Kramer, Bitsch, & Hanf, 2021). Business models that facilitate innovation and technology support the development of business processes, foster new product creation, and encourage collaboration, thereby enhancing efficiency and growth (Das et al., 2024). The role of products in driving product innovation and the impact of technology management have been examined, though mainly focusing on specific practices (Teran, 2024). A more comprehensive approach is needed to fully understand technology management's overall influence on products (da Costa et al., 2023). Moreover, strategic management of coffee processing businesses classified by size demonstrated that large businesses assign significantly greater importance to the Product, Innovation and Technology, Business Competition, and Business Alliance components than medium and small enterprises, a difference statistically significant at the 0.05 level. The coffee processing sector is characterised by intense competition expected to persist in response to growing coffee consumption.

Most operators are limited companies, followed by partnerships and public limited companies. The majority have been processing coffee for fewer than five years, primarily using domestic capital. In Thailand, coffee processing commonly involves a combination of manual labour and machinery, with medium and small businesses typically managing processing internally, whereas large firms tend to outsource this function. Critical challenges include raw material shortages, insufficient coffee bean supply, and elevated prices that fail to meet processing demand (Dos Santos et al., 2021). The rapid pace of innovation and technological advancement pressures resource-constrained businesses to adapt swiftly, accelerating product research and development to maintain competitiveness and increase product value. Forecasting trends in innovation and technology is hampered by limited investment and necessitates close collaboration between multiple organisations, including consumers, within the coffee processing sector. Such partnerships are essential to achieving success and mutual benefit in the industry.

Suggestions

Future research should prioritise cultivating coffee beans in sufficient quantities that satisfy demand and meet quality standards to build trust among entrepreneurs regarding processed coffee products. Studies ought to examine the design and implementation of training programmes that facilitate the practical application of knowledge in coffee cultivation, ensuring farmers benefit from effective knowledge management practices. Further research could focus on strengthening the capabilities of coffee processing entrepreneurs to enhance both the quantity and quality of their products. Additionally, investigations should explore ways to motivate entrepreneurs to increase exports of processed coffee products, including providing guidance on targeting appropriate international markets. Research aimed at improving climatic conditions to boost seed production is also recommended. Moreover, future studies should consider the strategic management of coffee planting and production to guarantee an adequate supply for processing, thereby improving competitiveness within the sector. Finally, comparative analyses of export marketing strategies for processed coffee products across foreign markets would be valuable for assessing Thailand's competitive position and identifying areas for further improvement.

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