

Adaptive Capability of Food MSMEs and Destination Food Security: The Mediating Roles of Business and Food Supply Stability and the Moderating Role of Tourist Arrival Fluctuations

Siwi Manganti ^{1*}, Gede Andika ², Muhammad Zakiyyul Fuad Rasyid ³, Shendy Human Arynata ⁴

^{1*} Management Study Program, Faculty of Economics, Business and Law, Universitas Bali Internasional Muhammadiyah, Denpasar City, Bali Province, Indonesia

² Entrepreneurship Study Program, Faculty of Economics, Business and Law, Universitas Bali Internasional Muhammadiyah, Denpasar City, Bali Province, Indonesia

³ Digital Business Study Program, Politeknik Hasnur, Barito Kuala Regency, South Kalimantan Province, Indonesia

⁴ Food Technology Study Program, Faculty of Informatics and Applied Sciences, Universitas Bali Internasional Muhammadiyah, Denpasar City, Bali Province, Indonesia

Email: siwimanganti@gmail.com ^{1*}, gedeandika.lecturer@gmail.com ², zakifuadrasyid@gmail.com ³, shendyhuman05@gmail.com ⁴

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Abstract

Food security in tourism destinations is increasingly exposed to tourism demand volatility, supply chain disruptions, and environmental uncertainty, highlighting the importance of adaptive local food enterprises. This study examines how adaptive capability contributes to destination food security through business stability and food supply stability, while considering tourist arrival fluctuations as an environmental contingency. Grounded in Dynamic Capabilities Theory, the study develops the Adaptive-Resilient Food System Model (ARFSM) to explain the organizational mechanisms through which food MSMEs can contribute to resilient destination food systems. A quantitative cross-sectional survey was conducted among 250 food MSME owners and managers operating across tourism destinations in Bali, Indonesia. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. The findings indicate that adaptive capability positively affects business stability ($\beta = 0.449$, $p < 0.001$), food supply stability ($\beta = 0.397$, $p < 0.001$), and destination food security ($\beta = 0.162$, $p = 0.038$). Business stability ($\beta = 0.127$, $p = 0.001$) and food supply stability ($\beta = 0.099$, $p = 0.003$) significantly mediate the relationship between adaptive capability and food security. Furthermore, tourist arrival fluctuations positively moderate the relationship between adaptive capability and food supply stability ($\beta = 0.148$, $p = 0.016$), indicating that adaptive capability becomes more consequential when tourism demand is more volatile. The findings extend Dynamic Capabilities Theory by linking firm-level adaptive capability with broader destination food-system resilience through organizational and supply-chain mechanisms. The study also proposes the ARFSM as an integrated framework for understanding how food MSMEs can support food-system continuity in tourism-dependent destinations.

Keywords:

Adaptive capability; Business stability; Destination food security; Food supply stability; Tourism destinations; Dynamic capabilities.

1. INTRODUCTION

Food security has become one of the most pressing global challenges in achieving sustainable development, particularly in the face of climate change, geopolitical conflicts, supply chain disruptions, and increasing market uncertainty. According to the Food and Agriculture Organization (FAO), food security is achieved when all people have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 2021). However, recent global disruptions have demonstrated that ensuring food security extends beyond increasing agricultural production; it also requires resilient food systems capable of anticipating, adapting to, and recovering from various environmental and economic shocks (HLPE, 2025). Consequently, strengthening food system resilience has become a strategic priority for governments, businesses, and researchers seeking to achieve sustainable development goals.

The issue is particularly important in tourism destinations, where food systems are influenced not only by local consumption but also by highly dynamic tourism activities. Tourism contributes significantly to regional economic development by creating employment opportunities, stimulating local businesses, and increasing demand for agricultural and food products. Nevertheless, tourism also generates considerable pressure on local food systems because fluctuations in tourist arrivals directly affect food demand, procurement planning, inventory management, and supply chain continuity (Hall & Gössling, 2016). During periods of high tourist arrivals, food businesses are required to rapidly increase production capacity and maintain continuous food availability, whereas periods of declining tourism often reduce business income, create operational inefficiencies, and threaten the sustainability of local food enterprises. These conditions indicate that destination food security depends not only on agricultural productivity but also on the adaptive capability of businesses operating within tourism ecosystems.

Bali represents one of the most appropriate contexts for examining this issue because tourism serves as the primary driver of its regional economy. The rapid growth of hotels, restaurants, cafés, and other tourism-related businesses has substantially increased the demand for local food products while simultaneously exposing food MSMEs to seasonal demand fluctuations and external environmental uncertainties. Food MSMEs function as strategic actors connecting local agricultural producers with tourism markets and therefore play a vital role in maintaining destination food availability. However, compared with larger firms, these enterprises generally possess limited financial resources, managerial capacity, technological capability, and supply chain integration, making them more vulnerable to disruptions caused by tourism fluctuations, climate-related events, and market instability (FAO, 2021). Therefore, improving the adaptive capability of food MSMEs is essential for strengthening both business sustainability and destination food security.

Bali's tourism-oriented food system creates a distinctive vulnerability for local food MSMEs because demand conditions are strongly shaped by tourism cycles. Periods of high tourist arrivals may generate sudden increases in demand for fresh, processed, and ready-to-eat food, requiring enterprises to adjust procurement volumes, production capacity, inventories, and labor allocation within a relatively short period. Conversely, declines in tourist arrivals can result in excess inventories, reduced cash flow, lower production utilization, and weaker purchasing capacity. These demand fluctuations may be compounded by environmental and logistical disruptions, including extreme weather, transportation constraints, and interruptions in agricultural supply. For micro and small food enterprises with limited financial buffers and bargaining power, such disruptions can simultaneously affect business continuity and the ability to maintain stable food supplies. Therefore, the adaptive capability of local food MSMEs is particularly relevant in tourism destinations where business viability and food-system continuity are closely interconnected.

From the perspective of Dynamic Capabilities Theory, organizations achieve sustainable competitive advantage through their ability to continuously sense environmental changes, seize emerging opportunities, and reconfigure organizational resources in response to uncertainty (Teece, 2007). One of the most important manifestations of dynamic capabilities is adaptive capability, which reflects an organization's ability to modify its strategies, operational processes, resource allocation, and organizational routines to respond effectively to changing business environments. Recent studies have demonstrated that adaptive capability positively influences organizational resilience, innovation performance, supply chain resilience, digital transformation, and long-term business sustainability, particularly among micro, small, and medium-sized enterprises (MSMEs) operating in highly dynamic environments (Putritamara et al., 2023). These findings suggest that adaptive capability has become an increasingly important organizational competence for maintaining business continuity under uncertain conditions.

Despite the growing body of literature on adaptive capability, several important research gaps remain. First, previous studies have predominantly investigated adaptive capability from the perspective of organizational outcomes, including business performance, innovation capability, organizational resilience, and competitive advantage, while relatively limited attention has been devoted to its contribution to destination food security. Food security represents a broader societal outcome involving the interaction of businesses, supply chains, consumers, and regional food systems rather than merely firm-level performance (Tendall et al., 2015). Consequently, understanding how adaptive capability contributes to food security requires a more comprehensive analytical perspective than has been provided by previous studies.

Second, existing studies generally assume a direct relationship between adaptive capability and organizational resilience without adequately explaining the organizational mechanisms through which adaptive capability generates broader food system outcomes. In practice, adaptive capability is unlikely to improve destination food security directly. Instead, organizations with strong adaptive capability are expected to first strengthen business stability by maintaining operational continuity, financial sustainability, and organizational flexibility. Subsequently, stronger business stability is expected to enhance food supply stability through improved procurement strategies, supplier diversification, inventory management, and supply chain coordination, ultimately contributing to destination food security. However, empirical studies simultaneously examining these parallel mediating mechanisms remain limited, particularly within tourism-dependent food systems.

Third, previous tourism studies have generally considered fluctuations in tourist arrivals as external environmental conditions rather than as variables that influence the effectiveness of organizational capabilities. Dynamic Capabilities Theory suggests that organizational capabilities become increasingly valuable under conditions of environmental turbulence (Teece, 2007). Accordingly, fluctuations in tourist arrivals may strengthen or weaken the influence of adaptive capability on food supply stability depending on the level of environmental uncertainty. Nevertheless, this moderating relationship has received relatively little empirical attention, creating an important opportunity for further investigation.

To address these theoretical and empirical gaps, this study proposes the Adaptive-Resilient Food System Model (ARFSM), an integrated conceptual framework that explains how adaptive capability contributes to destination food security through the mediating roles of business stability and food supply stability, while simultaneously considering the moderating effect of tourist arrival fluctuations. By integrating organizational capability, operational resilience, tourism dynamics, and food security into a single structural model.

The theoretical contribution of this study lies in specifying how adaptive capability operates beyond the firm-performance domain by identifying organizational and supply-chain mechanisms through which it may contribute to destination food-system resilience. First, the findings position business stability as an organizational pathway through which adaptive capability is translated into continuity-oriented outcomes. Second, food supply stability represents a supply-chain pathway connecting firm-level adaptation with the continuity of food availability within tourism destinations. Third, tourist arrival fluctuations function as an environmental contingency that changes the strength of the adaptive capability-food supply stability relationship. Thus, the proposed ARFSM does not merely add food security as another outcome of dynamic capabilities; it specifies the organizational mechanisms and environmental conditions through which adaptive capability becomes consequential for destination food-system resilience.

Accordingly, this study aims to examine the direct effects of adaptive capability on business stability, food supply stability, and destination food security. Furthermore, the study investigates the mediating roles of business stability and food supply stability as well as the moderating effect of tourist arrival fluctuations on the relationship between adaptive capability and food supply stability. Using data collected from food MSMEs operating across tourism destinations in Bali Province and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), this study seeks to provide robust empirical evidence regarding the organizational mechanisms that support destination food security.

This research is expected to make several important contributions. Theoretically, it extends Dynamic Capabilities Theory by demonstrating that adaptive capability influences not only organizational performance but also broader food system resilience through multiple organizational pathways. The study also contributes to tourism and food security literature by introducing the Adaptive-Resilient Food System Model (ARFSM) as a comprehensive framework integrating adaptive capability, business stability, food supply stability, and tourism dynamics. Practically, the findings provide strategic recommendations for policymakers, tourism authorities, and MSME managers in designing adaptive business development programs, strengthening local food supply chains, and enhancing destination food security through more resilient tourism food systems.

2. RESEARCH METHOD

This study employed a quantitative explanatory research design to examine the relationships among adaptive capability, business stability, food supply stability, tourist arrival fluctuations, and destination food security. The research adopted a cross-sectional survey approach because the research adopted a cross-sectional survey approach because the objective was to empirically test the hypothesized relationships among latent constructs using data collected from food micro, small, and medium-sized enterprises (MSMEs) operating in tourism destinations. The conceptual framework was developed based on Dynamic Capabilities Theory, which posits that firms create sustainable competitive advantage through their ability to sense environmental changes, seize emerging opportunities, and continuously reconfigure organizational resources (Teece, 2007). The proposed model also incorporates organizational resilience and food system resilience perspectives to explain how adaptive capability contributes to destination food security.

The study was conducted in Bali Province, Indonesia, one of the country's leading tourism destinations, where local food MSMEs play a strategic role in supporting tourism activities and maintaining regional food

availability. The research population consisted of food MSMEs officially registered in Bali Province, including businesses engaged in food production, food processing, and food service activities. These enterprises were selected because they directly supply food products to hotels, restaurants, cafés, retail outlets, and tourists, making them essential actors within the destination food system.

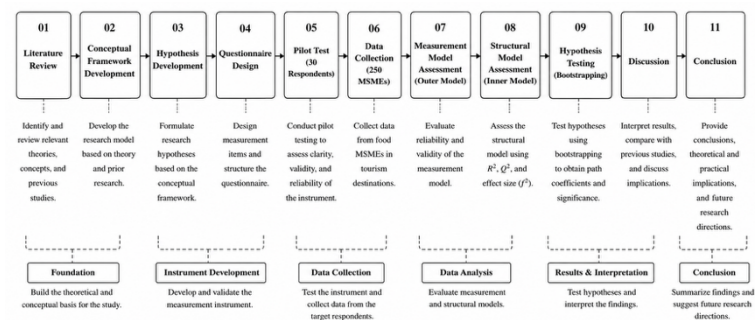


Figure 1. Research Procedure

Figure 1 illustrates the overall research procedure adopted in this study. The process began with a comprehensive literature review to establish the theoretical foundation and develop the conceptual framework and research hypotheses. Subsequently, a structured questionnaire was designed and evaluated through a pilot test involving 30 respondents to assess its clarity, validity, and reliability. Following the pilot study, data were collected from 250 food MSMEs operating in tourism destinations across Bali Province. A statistical power analysis was conducted to determine the minimum sample size required for the structural model, considering the maximum number of predictors of an endogenous construct, the anticipated effect size, significance level, and desired statistical power. The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The analytical procedure consisted of evaluating the measurement model (outer model), assessing the structural model (inner model), and testing the proposed hypotheses using the bootstrapping technique. Finally, the empirical findings were interpreted and discussed to draw conclusions and derive theoretical and managerial implications.

A stratified random sampling technique was employed to ensure proportional representation across Bali's nine regencies and municipalities. The sampling strata were established based on the geographical distribution of food MSMEs obtained from the Bali Provincial Statistics Office (BPS Bali). Within each stratum, respondents were randomly selected according to two business categories: ready-to-eat food enterprises and processed food enterprises. Following the recommendation of Hair et al. (2022) for Structural Equation Modeling, a minimum sample exceeding 200 respondents was considered adequate for complex structural models. Accordingly, data were successfully collected from 250 food MSME owners or managers, providing sufficient statistical power for subsequent analyses.

Data collection was conducted between June and July 2025 using a structured questionnaire administered through direct field visits and online distribution. Prior to the main survey, the questionnaire was reviewed by experts in strategic management and food business management to establish content validity. A pilot study involving 30 MSME owners was subsequently conducted to ensure the clarity, readability, and reliability of the measurement items. Minor revisions were made based on respondents' feedback before the questionnaire was distributed to the full sample.

All constructs were measured using previously validated scales adapted from the relevant literature and modified to suit the context of food MSMEs operating in tourism destinations. Adaptive Capability was operationalized through four dimensions, namely economic and institutional capability, social and physical capability, information and environmental capability, and agricultural and nutritional capability. Business Stability measures the firm's ability to maintain operational continuity and financial sustainability during environmental uncertainty. Food Supply Stability assessed the consistency of food procurement, supplier reliability, inventory availability, and supply chain continuity. Food Security represented the dependent variable and was measured using four dimensions: food availability, food accessibility, food utilization, and stability of food access. Finally, Tourist Arrival Fluctuations were measured as a moderating construct reflecting respondents' perceptions regarding seasonal changes in tourist demand and their influence on business operations. All measurement items employed a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 1. Operational Definition of Variables

Construct	Definition	Indicators	Source
Adaptive Capability (X)	The ability of firms to sense environmental changes, seize opportunities, and reconfigure resources	Economic & Institutional, Social & Physical, Information & Environmental, Agricultural & Nutritional	Teece (2007); Putritamara et al. (2023)

Business Stability (M1)	The ability to maintain operational and financial continuity	Operational continuity, financial stability, organizational flexibility	Adapted from organizational resilience literature
Food Supply Stability (M2)	The ability to maintain continuous food procurement and supply	Supplier diversification, inventory, procurement, supply continuity	Tendall et al. (2015)
Tourist Arrival Fluctuations (Z)	Variability in tourist arrivals affecting business operations	Seasonal demand, tourism uncertainty	Adapted from tourism resilience literature
Food Security (Y)	Continuous food availability, accessibility, utilization, and stability	Availability, Accessibility, Utilization, Stability	FAO (2021)

The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS version 4.0. PLS-SEM was selected because it is particularly appropriate for predictive research involving complex structural relationships, mediation effects, and moderating variables while accommodating non-normal data distributions and latent constructs measured by multiple indicators (Hair et al., 2022). The analytical procedure consisted of two sequential stages. First, the measurement model (outer model) was evaluated by examining indicator reliability, convergent validity, discriminant validity, Composite Reliability (CR), Cronbach's Alpha, and Average Variance Extracted (AVE). Second, the structural model (inner model) was assessed using the coefficient of determination (R^2), predictive relevance (Q^2), effect size (f^2), and hypothesis testing through the bootstrapping procedure. Mediation effects were evaluated using indirect effect analysis, whereas moderation effects were examined through interaction terms generated within the PLS-SEM framework.

In addition, full collinearity variance inflation factors (VIFs) were examined to identify potential common method bias and multicollinearity. All VIF values were below the recommended threshold of table 2, indicating that common method bias and critical collinearity were unlikely to materially affect the structural estimates.

Table 2. Full Collinearity VIF Results

Construct	VIF
Adaptive Capability (X)	1.712
Business Stability (M1)	1.018
Food Supply Stability (M2)	1.539
Tourist Arrival Fluctuations (Z)	1.585
Food Security (Y)	1.434

To assess the potential for common method bias, a full collinearity variance inflation factor (VIF) test was conducted following the procedure recommended by Kock (2015). This test examines each construct by regressing it on all other constructs in the model simultaneously, with VIF values above 3.3 indicating a problematic level of collinearity that would signal common method bias. The results showed that all five constructs obtained VIF values well below this threshold: AC = 1.712, BS = 1.018, FSS = 1.539, TAF = 1.585, and FS = 1.434 (range: 1.018–1.712). All VIF values were below the recommended threshold of 3.3, indicating that common method bias and critical collinearity were unlikely to materially affect the structural estimates.

To ensure research ethics, all respondents voluntarily participated in the study after receiving information regarding the objectives of the research and the confidentiality of their responses. No, personally identifiable information was disclosed, and all collected data were analyzed only for academic purposes. Respondents were informed that participation was entirely voluntary and that they could withdraw from the survey at any stage without consequence.

2.1. Conceptual Framework

This study is grounded in Dynamic Capabilities Theory (DCT), which posits that organizations achieve sustainable performance through their ability to continuously sense environmental changes, seize emerging opportunities, and reconfigure organizational resources in response to dynamic business environments (Teece, 2007). Within the context of tourism destinations, adaptive capability enables food MSMEs to respond effectively to fluctuations in tourist demand, supply chain disruptions, and changing market conditions. As a result, adaptive capability is expected to strengthen business stability, improve food supply stability, and ultimately enhance destination food security.

The proposed research model also incorporates the concept of food system resilience, which emphasizes that food security depends not only on food production but also on the resilience of organizations and supply chains responsible for maintaining continuous food availability (Tendall et al., 2015; HLPE, 2025). Accordingly, business stability and food supply stability are conceptualized as complementary organizational

mechanisms linking adaptive capability to destination food security. Furthermore, fluctuations in tourist arrivals are incorporated as a moderating variable because tourism demand volatility may alter the effectiveness of adaptive capability in maintaining supply chain continuity.

Based on these theoretical arguments, this study proposes the Adaptive-Resilient Food System Model (ARFSM), which explains the relationships among adaptive capability, business stability, food supply stability, tourist arrival fluctuations, and destination food security.

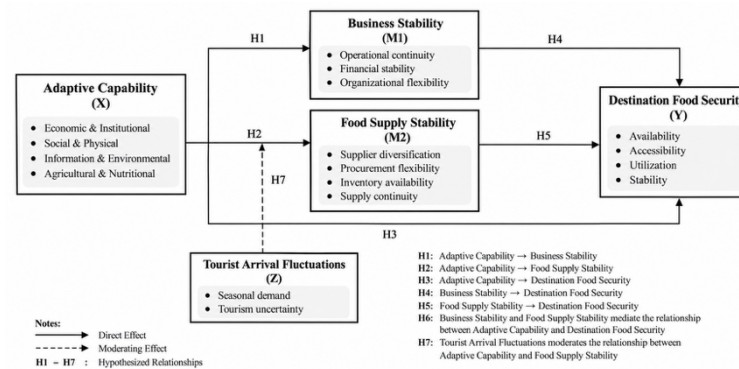


Figure 2. Conceptual Framework of the Study

The conceptual framework illustrates that adaptive capability serves as the primary organizational capability influencing destination food security through multiple organizational pathways. Business stability and food supply stability function as mediating variables, whereas tourist arrival fluctuations act as an environmental contingency influencing the relationship between adaptive capability and food supply stability. This integrated framework extends Dynamic Capabilities Theory by linking firm-level organizational capability with destination-level food system resilience.

2.2. Research Hypotheses

Based on Dynamic Capabilities Theory and previous empirical findings, seven hypotheses are proposed.

H1. Adaptive Capability → Business Stability

Adaptive capability enables firms to respond rapidly to environmental uncertainty by reallocating resources, adjusting operational strategies, and maintaining organizational flexibility. Organizations possessing stronger adaptive capability are therefore more likely to sustain business continuity during periods of market turbulence (Teece, 2007; Putritamara et al., 2023). H1: Adaptive capability has a positive effect on business stability.

H2. Adaptive Capability → Food Supply Stability

Adaptive organizations continuously improve procurement strategies, diversify suppliers, and strengthen supply chain coordination. Consequently, firms with higher adaptive capability are expected to maintain more stable food supplies despite external disruptions. H2: Adaptive capability positively influences food supply stability.

H3. Adaptive Capability → Food Security

Organizations capable of rapidly adapting to environmental change are expected to contribute directly to maintaining destination food availability and accessibility. H3: Adaptive capability positively affects destination food security.

H4. Business Stability → Food Security

Business continuity enables firms to maintain production capacity, financial sustainability, and consistent food distribution, thereby contributing to destination food security. H4: Business stability positively influences destination food security.

H5. Food Supply Stability → Food Security

Stable food procurement and resilient supply chains improve food availability and accessibility within tourism destinations. H5: Food supply stability positively influences destination food security.

H6. Business Stability and Food Supply Stability as Mediators

Adaptive capability is expected to strengthen destination food security indirectly by improving organizational stability and maintaining continuous food supplies. H6: Business stability and food supply stability mediate the relationship between adaptive capability and destination food security.

H7. Moderating Effect of Tourist Arrival Fluctuations

Dynamic Capabilities Theory argues that organizational capabilities become increasingly valuable under environmental turbulence. Therefore, fluctuations in tourist arrivals are expected to alter the effectiveness of adaptive capability in maintaining food supply stability. H7: Tourist arrival fluctuations moderate the relationship between adaptive capability and food supply stability.

3. RESULTS AND DISCUSSION

3.1. Result

3.1.1. Respondent Profile

The proportional allocation was determined based on the distribution of 81,026 food MSMEs in Bali Province reported by the Bali Statistics Agency (BPS Bali, 2023). Within each regency/city stratum, respondents were further selected according to two business categories: ready-to-eat food businesses and processed food businesses. This study surveyed 250 owners and managers of local food micro, small, and medium-sized enterprises (MSMEs) operating across tourism destinations in Bali Province. Respondents were selected using a stratified random sampling approach based on regency/city and business type to ensure proportional representation of food businesses throughout the province. This sampling strategy improves the geographical and business-category coverage of the sample and provides a structured basis for examining food MSMEs across Bali's tourism destinations. The demographic characteristics of the respondents are presented in Table 2.

Table 2. Respondent Profile

Characteristics	Category	Frequency (n)	Percentage (%)
Regency/City	Badung Regency	52	20.8
	Denpasar City	50	20.0
	Gianyar Regency	40	16.0
	Tabanan Regency	29	11.6
	Buleleng Regency	25	10.0
	Karangasem Regency	20	8.0
	Klungkung Regency	12	4.8
	Jembrana Regency	12	4.8
	Bangli Regency	10	4.0
Business Type	Ready-to-Eat Food	145	58.0
	Processed Food	105	42.0
Business Age	Less than 2 years	30	12.0
	2–5 years	87	34.8
	5–10 years	95	38.0
	More than 10 years	38	15.2
Number of Employees	1–4 employees	113	45.2
	5–9 employees	95	38.0
	10–19 employees	42	16.8
Average Monthly Revenue	Less than IDR 5 million	48	19.2
	IDR 5–15 million	102	40.8
	IDR 15–50 million	78	31.2
	More than IDR 50 million	22	8.8

Source: Primary data processed by the authors (2026)

As shown in Table 2, the sample successfully represents all nine regencies and cities in Bali Province, reflecting the study's stratified random sampling design. Badung Regency contributed the largest proportion of respondents (52 MSMEs; 20.8%), followed by Denpasar City (50 MSMEs; 20.0%) and Gianyar Regency (40 MSMEs; 16.0%). These three regions constitute Bali's principal tourism hubs and therefore host the highest concentration of food-related MSMEs serving both domestic and international visitors.

Meanwhile, Tabanan Regency (29 respondents; 11.6%) and Buleleng Regency (25 respondents; 10.0%) represent emerging tourism destinations with steadily growing food business activities. The remaining regions Karangasem (20 respondents; 8.0%), Klungkung (12 respondents; 4.8%), Jembrana (12 respondents; 4.8%), and Bangli (10 respondents; 4.0%) are characterized by relatively lower tourism intensity but remain important contributors to Bali's regional food supply network. Their inclusion ensures that the findings capture the diversity of tourism development and food business conditions across the province.

Regarding business characteristics, ready-to-eat food enterprises accounted for 58.0% of the sample, indicating that the tourism industry relies heavily on businesses providing immediate food services to visitors. The remaining 42.0% consisted of processed food producers, which primarily supply packaged and locally processed food products.

With respect to business experience, enterprises operating for five to ten years represented the largest group (38.0%), followed by businesses established for two to five years (34.8%). This distribution suggests that most participating MSMEs have accumulated sufficient operational experience while remaining adaptable to changing market conditions.

The respondent profile also indicates that most enterprises operate on a micro-business scale. Nearly half of the businesses (45.2%) employ between one and four workers, whereas 38.0% employ five to nine workers.

Only 16.8% reported employing between 10 and 19 workers, reflecting the predominance of labor-intensive small enterprises within Bali's local food sector.

From a financial perspective, 40.8% of respondents reported average monthly revenues ranging from IDR 5 million to IDR 15 million, while 31.2% generated revenues between IDR 15 million and IDR 50 million. These figures suggest that most participating businesses operate within the lower- to middle-income MSME segment, highlighting their economic importance while simultaneously illustrating their vulnerability to market fluctuations associated with tourism demand.

Overall, the respondent profile demonstrates that the study encompasses a broad spectrum of food MSMEs across Bali's tourism destinations. The proportional representation of geographical areas, business categories, firm age, workforce size, and revenue levels. The proportional representation across geographical areas and business categories strengthens the contextual coverage of the sample and provides a useful empirical basis for examining food MSMEs operating across Bali's tourism destinations and provides a robust empirical foundation for examining how adaptive capabilities contribute to business stability, food supply stability, and food security within tourism dependent regions.

3.1.2. Descriptive Statistics of the Research Variables

Descriptive statistical analysis was conducted to provide an overview of respondents' perceptions regarding each construct examined in this study before testing the structural model. The analysis presents the minimum value, maximum value, mean, standard deviation, and category of each research variable. Collectively, these statistics offer an initial understanding of the overall condition of adaptive capability, business stability, food supply stability, food security, and tourist arrival fluctuations among food MSMEs operating in Bali's tourism destinations. The results are presented in Table 3.

Table 3. Descriptive Statistics of the Research Variables

Variable	Min	Max	Mean	Std. Dev.	Category
Adaptive Capability (X)	2.21	4.97	3.82	0.614	High
Business Stability (M1)	2.40	5.00	3.74	0.598	High
Food Supply Stability (M2)	2.20	4.95	3.68	0.621	High
Food Security (Y)	2.35	5.00	3.71	0.609	High
Tourist Arrival Fluctuations (Z)	2.10	5.00	3.54	0.681	Moderate-High

Note: Responses were measured using a five-point Likert scale. Category intervals were defined as follows: 1.00–1.80 = Very Low; 1.81–2.60 = Low; 2.61–3.40 = Moderate; 3.41–4.20 = High; and 4.21–5.00 = Very High.

Source: Primary data processed by the authors (2026).

3.1.3. Measurement Model Assessment (Outer Model Evaluation)

Before evaluating the structural relationships among the constructs, the measurement model was assessed to ensure that the research instrument demonstrated satisfactory levels of validity and reliability. Following the PLS-SEM procedure recommended by Hair et al. (2022), the assessment focused on convergent validity, internal consistency reliability, and discriminant validity. Convergent validity was evaluated using outer loadings and the Average Variance Extracted (AVE), whereas reliability was examined through Composite Reliability (CR) and Cronbach's Alpha.

3.1.3.1. Convergent Validity

The results presented demonstrate that all measurement indicators achieved outer loading values above the recommended threshold of 0.70, indicating that each indicator adequately reflects its corresponding latent construct. These findings confirm that the observed variables exhibit satisfactory convergent validity and are appropriate measures of their intended constructs.

The Adaptive Capability construct exhibited outer loadings ranging from 0.763 to 0.823, suggesting that all twelve indicators contribute meaningfully to explaining firms' adaptive capabilities. Similarly, the indicators representing Business Stability, Food Supply Stability, Food Security, and Tourist Arrival Fluctuations consistently exceeded the minimum loading requirement, further supporting the robustness of the measurement model.

Regarding internal consistency reliability, all constructs reported Composite Reliability (CR) values well above 0.70, ranging from 0.879 to 0.939, indicating excellent internal consistency among the indicators measuring each latent variable. Notably, the Food Security construct recorded the highest reliability (CR = 0.939), followed closely by Adaptive Capability (CR = 0.936), suggesting that these constructs are measured with a high degree of precision.

The Average Variance Extracted (AVE) values ranged from 0.613 to 0.656, all exceeding the recommended threshold of 0.50. These results indicate that each construct explains more than half of the variance in its respective indicators, thereby providing strong evidence of convergent validity. Likewise, Cronbach's Alpha coefficients ranged between 0.831 and 0.927, surpassing the acceptable criterion of 0.70. These findings further confirm that the measurement scales possess satisfactory internal consistency and are

reliable for empirical analysis. Overall, the convergent validity assessment demonstrates that all constructs satisfy the recommended PLS-SEM criteria. The consistently high outer loadings, Composite Reliability, Average Variance Extracted, and Cronbach's Alpha values collectively indicate that the measurement model is both reliable and valid. Consequently, the analysis can proceed to the assessment of discriminant validity and the subsequent evaluation of the structural model.

All research constructs achieved mean scores above 3.50, indicating that respondents generally adaptive capability, business stability, food supply stability, and food security to be at a high level. Overall, these findings suggest that food MSMEs in Bali's tourism destinations possess relatively strong adaptive capacities and resilient business practices despite operating under fluctuating tourism demand.

Among the constructs, Adaptive Capability recorded the highest mean ($M = 3.82$; $SD = 0.614$), reflecting the ability of food MSMEs to respond effectively to environmental changes through flexible operations and adaptive business strategies. Within this construct, the Agricultural and Nutritional Dimension showed the highest score ($M = 3.88$), whereas the Information and Environmental Dimension had the lowest ($M = 3.76$), indicating opportunities to further strengthen information utilization and environmental adaptation.

Business Stability ($M = 3.74$; $SD = 0.598$) and Food Supply Stability ($M = 3.68$; $SD = 0.621$) were both rated highly, suggesting that most respondents were able to maintain operational continuity and stable food supplies despite seasonal tourism fluctuations. Similarly, Food Security achieved a high mean score ($M = 3.71$; $SD = 0.609$), with Food Availability recording the highest dimension ($M = 3.78$) and Stability of Food Access the lowest ($M = 3.65$), indicating that maintaining consistent food access across tourism seasons remains a challenge.

Finally, Tourist Arrival Fluctuations obtained a mean score of 3.54 ($SD = 0.681$), suggesting that respondents perceived tourism demand variability as an important environmental factor affecting business performance. Overall, the descriptive statistics indicate favorable conditions across all constructs while highlighting tourist arrival fluctuations as a critical contextual factor to be further examined in the structural model.

3.1.3.2. Discriminant Validity

After establishing convergent validity and internal consistency reliability, the next step was to evaluate discriminant validity to determine whether each construct was empirically distinct from the others. In this study, discriminant validity was assessed using two complementary approaches recommended in the PLS-SEM literature: the Heterotrait–Monotrait Ratio (HTMT) and the Fornell–Larcker Criterion. Employing both methods provides stronger evidence that each latent construct captures a unique theoretical concept and is not excessively correlated with other constructs in the model.

Table 4. Discriminant Validity Assessment Using the HTMT Criterion

Construct	Adaptive Capability (X)	Business Stability (M1)	Food Supply Stability (M2)	Food Security (Y)	Tourist Arrival Fluctuations (Z)
Adaptive Capability (X)	—				
Business Stability (M1)	0.621	—			
Food Supply Stability (M2)	0.598	0.574	—		
Food Security (Y)	0.647	0.612	0.589	—	
Tourist Arrival Fluctuations (Z)	0.312	0.298	0.341	0.287	—

Note: All HTMT values are below 0.85, indicating satisfactory discriminant validity.

Source: SmartPLS 4.0 analysis (2026).

3.1.3.3. Interpretation of HTMT Results

As presented in Table 4, all HTMT values are substantially below the recommended threshold of 0.85, providing strong evidence that the latent constructs are empirically distinguishable from one another. The highest HTMT value (0.647) was observed between Adaptive Capability and Food Security, which remains well within the acceptable range. This finding indicates that although the two constructs are theoretically related, they represent conceptually different phenomena.

Furthermore, relatively low HTMT values involving Tourist Arrival Fluctuations (ranging from 0.287 to 0.341) suggest that this contextual variable measures a construct distinct from the endogenous variables included in the research model. Consequently, the HTMT assessment confirms that each latent variable captures a unique aspect of the proposed theoretical framework.

Table 5. Discriminant Validity Assessment Using the Fornell–Larcker Criterion

Construct	Adaptive Capability (X)	Business Stability (M1)	Food Supply Stability (M2)	Food Security (Y)	Tourist Arrival Fluctuations (Z)
Adaptive Capability (X)	0.783				
Business Stability (M1)	0.524	0.810			
Food Supply Stability (M2)	0.498	0.487	0.799		
Food Security (Y)	0.541	0.516	0.494	0.801	
Tourist Arrival Fluctuations (Z)	0.261	0.248	0.284	0.239	0.803

Note: The diagonal values (bold) represent the square root of the Average Variance Extracted (AVE). Discriminant validity is achieved when each diagonal value exceeds the correlations between that construct and all other constructs.

Source: SmartPLS 4.0 analysis (2026).

The results shown in Table 5 further support the discriminant validity of the measurement model. For every construct, the square root of the AVE is greater than its correlations with all other constructs, satisfying the Fornell–Larcker criterion. This indicates that each construct shares more variance with its own indicators than with indicators belonging to other latent variables.

For example, Business Stability achieved a square root of AVE of 0.810, which is substantially higher than its correlations with Adaptive Capability (0.524), Food Supply Stability (0.487), Food Security (0.516), and Tourist Arrival Fluctuations (0.248). Similar patterns were observed across all remaining constructs, confirming that no overlap exists that could threaten the distinctiveness of the measurement scales.

The combined evidence obtained from the HTMT and Fornell–Larcker assessments demonstrate that the proposed measurement model satisfies all recommended criteria for discriminant validity. Each construct measures a theoretically unique concept, and no indication of multicollinearity or construct redundancy was detected. Taken together with the findings from the convergent validity and reliability assessments, the measurement model can be considered both psychometrically sound and statistically robust. Consequently, the measurement instrument is appropriate for testing the structural relationships proposed in the research model, allowing the analysis to proceed to the evaluation of the inner (structural) model.

3.1.4. Structural Model Assessment (Inner Model Evaluation)

Following the confirmation that the measurement model met all validity and reliability requirements, the next stage involved assessing the structural model (inner model). This analysis was conducted to examine the model's predictive capability and evaluate the hypothesized relationships among the latent constructs. In accordance with the PLS-SEM guidelines proposed by Hair et al. (2022), the structural model was evaluated using the coefficient of determination (R^2), predictive relevance (Q^2), and effect size (f^2) prior to hypothesis testing.

3.1.4.1. Coefficient of Determination (R^2) and Predictive Relevance (Q^2)

The coefficient of determination (R^2) measures the proportion of variance in each endogenous construct explained by its predictor variables. Higher R^2 values indicate greater explanatory power of the proposed structural model. In addition, Stone–Geisser's Q^2 statistic obtained through the blindfolding procedure evaluates the predictive relevance of the model. The positive Q^2 values indicate predictive relevance within the assessment procedure employed.

Table 6. Coefficient of Determination (R^2) and Predictive Relevance (Q^2)

Endogenous Construct	R^2	Adjusted R^2	Q^2 (Blindfolding)	Interpretation (R^2)	Interpretation (Q^2)
Business Stability (M1)	0.432	0.428	0.312	Moderate	Moderate
Food Supply Stability (M2)	0.389	0.381	0.278	Moderate	Moderate
Food Security (Y)	0.587	0.581	0.421	Substantial	Moderate

Note: According to Cohen (1988), R^2 values above 0.25 indicate moderate explanatory power, whereas values above 0.50 indicate substantial explanatory power. Positive Q^2 values demonstrate predictive relevance.

Source: SmartPLS 4.0 analysis (2026).

- The findings presented in Table 6 indicate that the proposed research model demonstrates moderate to substantial explanatory power. Specifically, Adaptive Capability explains 43.2% of the variance in Business Stability ($R^2 = 0.432$), suggesting that adaptive capability represents an important determinant of

- operational stability among food MSMEs. The remaining unexplained variance may be attributable to other organizational or environmental factors not incorporated into the present model.
- Similarly, the model accounts for 38.9% of the variance in Food Supply Stability ($R^2 = 0.389$). Although classified as a moderate level of explanatory power, this result indicates that adaptive capability substantially contributes to maintaining a reliable food supply within tourism destinations. Nevertheless, food supply stability is also likely influenced by external conditions such as supplier relationships, logistics infrastructure, transportation systems, and market disruptions.
 - The R^2 value of 0.587 indicates that Adaptive Capability, Business Stability, and Food Supply Stability jointly explain 58.7% of the variance in the food security construct within the study sample. This level of explained variance indicates that the proposed model has substantial explanatory relevance in the present empirical context, while the remaining variance suggests that additional organizational, market, infrastructural, and institutional factors may also shape destination food-system conditions.
 - The predictive relevance assessment further supports the adequacy of the structural model. All endogenous constructs produced positive Q^2 values, namely 0.312 for Business Stability, 0.278 for Food Supply Stability, and 0.421 for Food Security. Since all Q^2 values exceed zero, the model demonstrates satisfactory predictive relevance, indicating that it possesses acceptable capability to predict observations beyond the estimation sample.

Overall, these findings confirm that the proposed structural model possesses both satisfactory explanatory power and predictive capability, providing a solid foundation for testing the hypothesized relationships among the constructs.

3.1.4.2. Effect Size (f^2)

While the coefficient of determination indicates the overall explanatory power of the structural model, effect size (f^2) evaluates the relative contribution of each exogenous construct to the R^2 value of an endogenous construct. Following Cohen (1988), effect sizes are classified as small (0.02), medium (0.15), and large (0.35).

Table 7. Effect Size (f^2) Among Constructs

Structural Relationship	f^2	Interpretation
Adaptive Capability → Business Stability	0.287	Medium
Adaptive Capability → Food Supply Stability	0.241	Medium
Adaptive Capability → Food Security	0.134	Small
Business Stability → Food Security	0.198	Medium
Food Supply Stability → Food Security	0.172	Medium
Adaptive Capability × Tourist Arrival Fluctuations → Food Supply Stability	0.089	Small

Note: According to Cohen (1988), f^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and large effects, respectively.

Source: SmartPLS 4.0 analysis (2026).

- The effect size analysis reveals that Adaptive Capability exerts a moderate influence on Business Stability ($f^2 = 0.287$), indicating that adaptive capability plays a meaningful role in enhancing the operational resilience of food MSMEs. This finding suggests that businesses capable of adjusting production capacity, reallocating resources, and responding to environmental changes are more likely to maintain stable business operations.
- Similarly, the relationship between Adaptive Capability and Food Supply Stability demonstrates a moderate effect size ($f^2 = 0.241$). This result indicates that adaptive capability substantially contributes to maintaining uninterrupted food supply systems by enabling firms to diversify suppliers, improve procurement flexibility, and respond effectively to disruptions affecting food availability.
- In contrast, the direct effect of Adaptive Capability on Food Security is comparatively smaller ($f^2 = 0.134$), although it remains meaningful. This finding suggests that adaptive capability influences food security primarily through indirect mechanisms—particularly through enhancing business stability and food supply stability—rather than solely through direct effects.
- The relationships between Business Stability and Food Security ($f^2 = 0.198$) and between Food Supply Stability and Food Security ($f^2 = 0.172$) both demonstrate moderate effect sizes, indicating that these two mediating constructs make substantial contributions to improving food security within tourism destinations. These findings reinforce the theoretical proposition that resilient business operations and stable food supply systems are essential components of a sustainable tourism food ecosystem.
- Finally, the interaction effect between Adaptive Capability and Tourist Arrival Fluctuations on Food Supply Stability produced a small yet meaningful effect size ($f^2 = 0.089$). Although modest in magnitude, this result suggests that fluctuations in tourist arrivals meaningfully alter the influence of adaptive capability on supply stability, providing preliminary evidence of a moderation effect that will be examined further through hypothesis testing.

Taken together, the R^2 , Q^2 , and f^2 results demonstrate that the proposed structural model possesses satisfactory explanatory power, predictive relevance, and practical significance. Adaptive Capability emerges as the principal driver of Business Stability and Food Supply Stability, while both mediating constructs substantially enhance Food Security. These findings indicate that the structural model is statistically robust and suitable for proceeding to the formal testing of the proposed hypotheses through bootstrapping analysis.

3.1.5. Hypothesis Testing

Once the measurement and structural models were evaluated, a bootstrapping procedure was performed to test the significance of the relationships between constructs in the research model. The bootstrapping procedure involved generating multiple subsamples from the research data to obtain an empirical distribution of the path coefficient estimates. The bootstrapping results were used to determine the β values (path coefficients), standard deviations, t-statistics, and p-values. The bootstrapping results are then used as a basis for determining whether the hypothesized relationships between variables in the study receive empirical support.

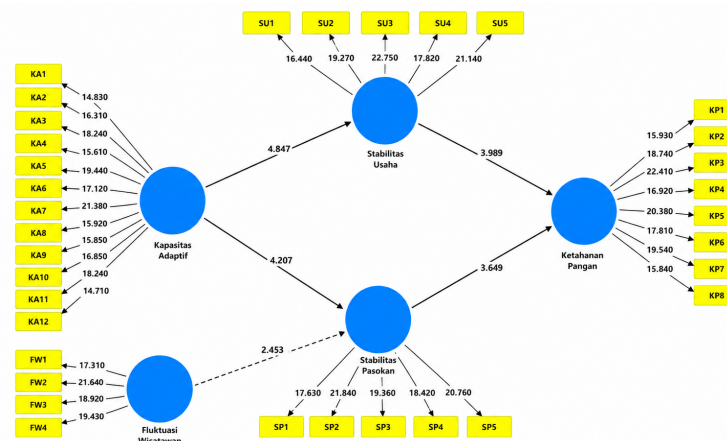


Figure 3. Bootstrapping Results (Source: Primary data processed by the author, 2026)

The bootstrapping results are then used as a basis for determining whether the hypothesized relationships between variables in the study receive empirical support. A hypothesis was considered supported when the corresponding p-value was below 0.05 and the t-value exceeded 1.96, following the recommended guidelines for PLS-SEM analysis.

Table 8. Results of Direct Effect Testing

Hypothesis	Relationship	β	t-value	p-value	Decision
H1	Adaptive Capability $\rightarrow$ Business Stability	0.449	7.242	<0.001	Supported
H2	Adaptive Capability $\rightarrow$ Food Supply Stability	0.397	6.115	<0.001	Supported
H3	Adaptive Capability $\rightarrow$ Food Security	0.162	2.077	0.038	Supported
H4	Business Stability $\rightarrow$ Food Security	0.284	3.851	<0.001	Supported
H5	Food Supply Stability $\rightarrow$ Food Security	0.249	3.320	0.001	Supported

Table 8 indicates that all direct relationships proposed in the conceptual model are positive and statistically significant. Adaptive Capability has a significant positive effect on Business Stability ($\beta = 0.449$, $p < 0.001$), indicating that food MSMEs with stronger adaptive capabilities are better able to maintain operational continuity under changing tourism conditions. Adaptive Capability also exerts a significant positive influence on Food Supply Stability ($\beta = 0.397$, $p < 0.001$), suggesting that adaptive organizations are more capable of maintaining stable procurement and supply chain operations.

Furthermore, Adaptive Capability has a positive direct effect on Food Security ($\beta = 0.162$, $p = 0.038$), although the magnitude of this relationship is relatively modest compared with the indirect organizational mechanisms. The results also demonstrate that both Business Stability ($\beta = 0.284$, $p < 0.001$) and Food Supply Stability ($\beta = 0.249$, $p = 0.001$) significantly contribute to destination food security. Collectively, these findings provide empirical support for H1–H5, confirming that adaptive capability contributes to food security both directly and through improved organizational performance.

Table 9. Results of Mediation Analysis

Hypothesis	Indirect Relationship	β	t-value	p-value	Decision
H6 ₁	Adaptive Capability $\rightarrow$ Business Stability $\rightarrow$ Food Security	0.127	3.241	0.001	Supported

H6 ₂	Adaptive Capability → Food Supply Stability → Food Security	0.099	2.934	0.003	Supported
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The mediation analysis provides evidence of parallel partial mediation. Business Stability and Food Supply Stability each significantly transmit part of the positive association between Adaptive Capability and Food Security. The indirect effect through Business Stability ($\beta = 0.127$, $p = 0.001$) is stronger than the indirect effect through Food Supply Stability ($\beta = 0.099$, $p = 0.003$). Because the direct effect of Adaptive Capability on Food Security remains statistically significant after the mediators are included, the findings indicate that the two mediators account for part, but not all, of the relationship. This pattern suggests that adaptive capability contributes to destination food-system outcomes through multiple organizational pathways rather than through a single sequential mechanism.

Table 10. Results of Moderation Analysis

Hypothesis	Interaction Effect	β	t-value	p-value	Decision
H7	Adaptive Capability × Tourist Arrival Fluctuations → Food Supply Stability	0.148	2.412	0.016	Supported

The moderating effect analysis indicates that Tourist Arrival Fluctuations significantly moderate the relationship between Adaptive Capability and Food Supply Stability ($\beta = 0.148$, $p = 0.016$). This finding suggests that the positive influence of adaptive capability on food supply stability becomes stronger under conditions of greater tourism demand volatility. In other words, adaptive capability provides greater strategic value when food MSMEs operate in more turbulent tourism environments. Therefore, H7 is supported.

Summary of Hypothesis Testing

Overall, the structural model supports all proposed hypotheses. Adaptive Capability emerged as the primary driver of Business Stability, Food Supply Stability, and Food Security. In addition, Business Stability and Food Supply Stability partially mediate the relationship between Adaptive Capability and Food Security, while Tourist Arrival Fluctuations strengthen the influence of Adaptive Capability on Food Supply Stability. These findings demonstrate that adaptive organizational capabilities contribute to destination food security through multiple organizational pathways, supporting the proposed Adaptive Resilient Food System Model (ARFSM).

3.2. Discussion

3.2.1. Adaptive Capability and Business Stability

The positive relationship between Adaptive Capability and Business Stability indicates that organizational adaptation is an important mechanism through which food MSMEs maintain continuity under tourism-related uncertainty. The relatively strong path coefficient ($\beta = 0.449$, $p < 0.001$) suggests that firms with greater capacity to adjust strategies, reallocate resources, and modify operating routines are better positioned to preserve operational and financial continuity. This finding is consistent with the microfoundational logic of Dynamic Capabilities Theory, in which organizational value is generated not simply by possessing resources but by continuously adapting and reconfiguring them in response to changing environments (Teece, 2007).

For food MSMEs in Bali, this capability is particularly relevant because tourism demand can change rapidly across seasons and market conditions. Adaptive capability allows enterprises to adjust production volumes, labor allocation, procurement decisions, product offerings, and marketing activities as demand conditions change. Therefore, the finding suggests that business stability should not be interpreted as the absence of environmental turbulence. Rather, it reflects an enterprise's ability to maintain functional continuity despite such turbulence. This distinction is important because resilience in tourism-dependent MSMEs depends not only on the stability of the external environment but also on the firm's capacity to respond to environmental variation.

3.2.2. Adaptive Capability and Food Supply Stability

The significant positive relationship between Adaptive Capability and Food Supply Stability ($\beta = 0.397$, $p < 0.001$) demonstrates that adaptive capability extends beyond internal business continuity to the management of food procurement and supply relationships. Food MSMEs with stronger adaptive capabilities are more likely to adjust procurement schedules, diversify suppliers, modify inventory decisions, and coordinate with supply-chain partners when demand or supply conditions change. The finding is consistent with the broader food-system resilience perspective, which emphasizes that resilience depends on the capacity of interconnected actors to absorb disruptions and reorganize their activities rather than relying solely on production capacity.

This result is particularly relevant in tourism destinations because food demand is temporally variable. During periods of increased tourist arrivals, enterprises must secure sufficient inputs without creating excessive procurement costs or stock-outs. During periods of declining demand, the same enterprises need to reduce procurement and inventory commitments to avoid waste and cash-flow pressure. Adaptive capability therefore

functions as a balancing mechanism between availability and flexibility. In this sense, food supply stability is not equivalent to maintaining constant supply volumes; rather, it reflects the capacity to maintain adequate and continuous supply while adjusting procurement and inventory decisions to changing conditions.

3.2.3. Food Security

The direct effect of Adaptive Capability on Food Security is positive but comparatively modest ($\beta = 0.162$, $p = 0.038$). This finding is theoretically informative because food security is a multidimensional and system-level outcome that cannot be generated by the adaptive capability of individual firms alone. Although adaptive MSMEs can adjust their operations and contribute to food availability and continuity, destination food security also depends on supplier networks, transportation infrastructure, market access, institutional coordination, consumer demand, and the broader regional food system. Therefore, the relatively smaller direct effect suggests that adaptive capability may contribute to food security primarily by influencing the organizational and supply-chain conditions through which food-system continuity is maintained.

3.2.4. Mediation

The mediation results provide an important explanation of how firm-level adaptive capability can translate into broader food-system outcomes. Both Business Stability and Food Supply Stability significantly mediate the relationship between Adaptive Capability and Food Security, with indirect effects of $\beta = 0.127$ and $\beta = 0.099$, respectively. Because the direct effect remains significant, the results indicate parallel partial mediation rather than full mediation. The somewhat stronger indirect effect through Business Stability suggests that maintaining operational and financial continuity may be an important first-order mechanism through which adaptive capability contributes to food-system outcomes. At the same time, the significant pathway through Food Supply Stability demonstrates that adaptation also operates through procurement and supply-chain continuity.

The two pathways therefore represent complementary mechanisms. Business stability enables enterprises to remain operational and financially capable of participating in local food markets, while food supply stability enables them to maintain the physical continuity of food procurement and distribution. Together, these mechanisms provide a more nuanced explanation of how firm-level capabilities can contribute to destination-level food-system resilience. This is an important extension of Dynamic Capabilities Theory because it shifts attention from the conventional organizational performance consequences of adaptation toward the mechanisms through which firm capabilities may generate broader system-level outcomes.

3.2.5. Moderation

The significant interaction between Adaptive Capability and Tourist Arrival Fluctuations ($\beta = 0.148$, $p = 0.016$) provides evidence that the value of adaptive capability is contingent upon the degree of tourism demand volatility. The positive interaction indicates that the relationship between adaptive capability and food supply stability becomes stronger as tourist arrival fluctuations increase. This finding is consistent with the central premise of Dynamic Capabilities Theory that the strategic value of adaptive capabilities becomes more pronounced when firms face rapidly changing and uncertain environments.

In a relatively stable tourism environment, food MSMEs may rely on established procurement routines, predictable production schedules, and stable supplier relationships. Under greater fluctuations in tourist arrivals, however, these routines may become insufficient. Enterprises must continuously reassess demand, adjust procurement volumes, modify inventory levels, and coordinate with suppliers. Consequently, the ability to sense changes and reconfigure resources becomes more valuable precisely when environmental turbulence increases. The moderation result therefore provides empirical support for viewing tourist arrival fluctuations not merely as a contextual characteristic of tourism destinations but as an environmental condition that changes the effectiveness of organizational adaptive capability.

3.2.6. Managerial and Policy Implementation Challenges

Despite the positive role of adaptive capability, strengthening this capability among food MSMEs is unlikely to be achieved through technology adoption or training programs alone. Many micro and small enterprises operate with limited financial buffers, informal managerial systems, restricted access to market information, and relatively weak bargaining power within supply chains. Consequently, interventions that require substantial investment in digital systems, inventory technologies, certification, or supplier diversification may be difficult to implement without institutional support.

The findings therefore suggest that MSME resilience policies should move beyond generic entrepreneurship training toward context-specific capability development. First, tourism and MSME agencies could facilitate shared market-information systems that provide timely information on tourism demand and food-market conditions. Second, collective procurement or supplier-network arrangements could reduce the transaction costs associated with supplier diversification. Third, digital platforms could be used not only for marketing but also for demand forecasting, inventory coordination, and communication with suppliers. Finally, resilience programs should recognize differences in firm size and resource availability, because strategies suitable for medium-sized enterprises may be unrealistic for micro-enterprises. Such interventions would

strengthen the organizational mechanisms identified in the ARFSM rather than treating food security as an outcome that can be addressed independently of enterprise-level capabilities.

4. CONCLUSION

This study examined how adaptive capability contributes to destination food security among food MSMEs operating in Bali's tourism destinations. The findings demonstrate that adaptive capability is positively associated with business stability, food supply stability, and food security. Importantly, the mediation analysis shows that business stability and food supply stability operate as parallel pathways through which adaptive capability contributes to food security. The direct effect of adaptive capability remains significant, indicating partial rather than full mediation.

The moderation analysis further demonstrates that tourist arrival fluctuations strengthen the relationship between adaptive capability and food supply stability. This finding indicates that the value of adaptive capability becomes more pronounced under conditions of greater tourism demand volatility. Thus, the study highlights that organizational adaptation is particularly important when food MSMEs face uncertain and rapidly changing tourism conditions.

Theoretically, the findings extend Dynamic Capabilities Theory by specifying how adaptive capability can generate outcomes beyond conventional firm-level performance through organizational and supply-chain mechanisms. The proposed Adaptive-Resilient Food System Model (ARFSM) integrates these mechanisms with tourism demand volatility and provides a framework for understanding the contribution of food MSMEs to resilient destination food systems.

From a managerial and policy perspective, strengthening adaptive capability requires more than improving individual business skills. Effective interventions should combine organizational learning, flexible business practices, digital information access, supplier diversification, and supply-chain collaboration. Tourism authorities and MSME development agencies should therefore design resilience programs that reflect the resource constraints of micro and small food enterprises.

Several limitations should be acknowledged. First, the cross-sectional design does not permit strong causal inference or observation of how adaptive capability and food-system resilience evolve over time. Second, the study focuses on food MSMEs in Bali, which limits the transferability of the findings to destinations with different tourism structures, institutional environments, and food-system configurations. Third, the study relies primarily on respondent perceptions, which may introduce common method and perceptual bias. Future research should employ longitudinal designs, objective tourism and food-supply indicators, multi-actor data, and comparative research across tourism destinations to further validate and extend the ARFSM.

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