The Impact of Government Support and Supplier Capabilities on Halal Cosmetics Supply Chain Agility, Operational, and Financial Performance

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ABSTRACT

This study investigates the antecedents and organizational performance outcomes of Halal Cosmetics Supply Chain Agility Practices (HCSCAP) within the Malaysian cosmetics sector. Drawing upon Dynamic Capabilities Theory (DCT) and the Resource-Based View (RBV), the framework focuses on key internal and external drivers, specifically government support and supplier capabilities, and evaluates their direct impact on HCSCAP, as well as the subsequent effect of HCSCAP on firms' operational performance and financial performance. A quantitative research design was employed to empirically test the hypothesized direct relationships. Primary data were collected via a structured online questionnaire administered to 205 cosmetics manufacturers registered with the National Pharmaceutical Regulatory Agency (NPRA) under the Ministry of Health Malaysia. The structural model and empirical hypotheses were analyzed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The empirical findings reveal that institutional government support significantly drives halal cosmetics supply chain agility, whereas supplier capabilities alone do not show a direct significant impact. In turn, higher levels of supply chain agility practices directly enhance both non-financial operational efficiency and financial returns among local cosmetic manufacturers. The discussion underscores that institutional backing paired with strong vendor partnerships provides firms with the dynamic capabilities needed to rapidly adapt to market shifts and complex compliance demands in the cosmetics sector. This study confirms the strategic importance of government support and supplier capabilities in fostering supply chain agility, directly translating to superior firm performance. The findings align directly with the targets of the Halal Industry Master Plan 2030 (HIMP 2030) and national economic priorities under the Twelfth and Thirteenth Malaysia Plans (RMK-12 and RMK-13), which prioritize ecosystem capability building, MSME competitiveness, and global halal leadership. Policymakers and agencies can leverage these insights to design targeted assistance programs, incentives, and supplier development initiatives, reinforcing Malaysia's standing as a high-value global halal cosmetics hub.

Keywords: Halal Cosmetics, Supply Chain Agility, Government Support, Supplier Capabilities, Firm Performance

INTRODUCTION

The global halal market has witnessed unprecedented growth over the past decade, shifting from a niche segment restricted to food and beverages into a comprehensive lifestyle industry that encompasses pharmaceuticals, logistics, personal care, and cosmetics (Tarmizi et al., 2021). Halal cosmetics, in particular, represent one of the fastest-growing sectors globally, driven by an expanding Muslim population, rising disposable incomes, and an increasing awareness of ethical, safe, and Shariah-compliant personal care products among both Muslim and non-Muslim consumers (Subri & Omar, 2026). In Malaysia, the government has positioned the country as a leading international halal hub through strategic industrial policies, such as the Halal Industry Master Plan 2030 (HIMP 2030) and the national economic priorities under the Twelfth and Thirteenth Malaysia Plans (RMK-12 and RMK-13) (HDC, 2020). Under these national frameworks, the local cosmetics industry, overseen by the National Pharmaceutical Regulatory Agency (NPRA) and certified by the Department of Islamic Development

Malaysia (JAKIM), is tasked with delivering high-quality, traceable, and compliant products to capture both domestic and international markets.

Despite these substantial growth opportunities, cosmetics manufacturers operate in a highly dynamic, volatile, and demanding business environment (Abdelilah et al., 2021). Fast-changing consumer trends, rapid technological shifts in product formulation, stringent regulatory compliance, and potential supply chain disruptions require manufacturers to be extraordinarily responsive (Eckstein et al., 2015). In this context, Supply Chain Agility (SCA), specifically tailored as Halal Cosmetics Supply Chain Agility Practices (HCSCAP), emerges as a core strategic capability. SCA refers to an organization's ability to swiftly adapt, reconfigure, and respond to unpredictable market changes without compromising product quality or operational efficiency (Abdelilah et al., 2021). In the cosmetics sector, agility must be maintained alongside strict adherence to halal integrity, ensuring that raw material sourcing, manufacturing, storage, and distribution remain fully compliant and free from cross-contamination (Tarmizi et al., 2021).

To cultivate supply chain agility, organizations must leverage both internal and external strategic resources (Subri & Omar, 2026). Grounded in Dynamic Capabilities Theory (DCT) and the Resource-Based View (RBV), this study focuses on two foundational drivers: Government Support and Supplier Capabilities. Government support provides the institutional backing, financial incentives, regulatory frameworks, and infrastructure development necessary for local small and medium enterprises (SMEs) and large manufacturers to navigate complex compliance demands (Tarmizi et al., 2021). Concurrently, supplier capabilities encompassing operational flexibility, quality management, and joint problem-solving ensure that raw material vendors can promptly deliver halal-certified ingredients and align with the manufacturer’s rapid production shifts (Abdelilah et al., 2021; Subri & Omar, 2026).

While existing literature has extensively examined supply chain management in the food sector, empirical research investigating how institutional government support and upstream supplier capabilities jointly foster supply chain agility within the halal cosmetics sector remains scarce (Tarmizi et al., 2021; Subri & Omar, 2026). Furthermore, there is a critical need to evaluate how HCSCAP directly translates into multidimensional organizational performance, specifically separating non-financial Operational Performance (e.g., productivity, flexibility, lead time reduction) and financial Financial Performance (e.g., profitability, sales growth, market share) (Eckstein et al., 2015; Subri & Omar, 2026). Addressing this empirical gap is vital for local manufacturers striving to enhance market competitiveness while aligning with national development agendas like HIMP 2030 (HDC, 2020).

Therefore, this study aims to empirically investigate the direct impact of government support and supplier capabilities on Halal Cosmetics Supply Chain Agility Practices (HCSCAP), and to assess the subsequent influence of HCSCAP on operational and financial performance among NPRA-registered cosmetics manufacturers in Malaysia. By utilizing Partial Least Squares Structural Equation Modelling (PLS-SEM) on primary survey data collected from 205 registered manufacturers, this research provides valuable theoretical contributions and practical insights for managers, supply chain practitioners, and policymakers. The remainder of this paper is structured as follows: Section 2 reviews the literature and hypothesis development; Section 3 outlines the methodology; Section 4 presents the empirical results; and Section 5 discusses the theoretical and policy implications.

METHODOLOGY

Research Design

To empirically investigate the relationships among government support, supplier capabilities, Halal Cosmetics Supply Chain Agility Practices (HCSCAP), operational performance, and financial performance, a quantitative, cross-sectional research design was adopted. A quantitative approach is particularly suitable for this study as it facilitates objective empirical testing of hypothesized direct relationships, minimizes researcher bias, and enables the generalization of findings across the target industry (Hair et al., 2021; Sekaran & Bougie, 2016). Grounded in a positivist research paradigm, this study employs deductive reasoning to test theoretical framework models

derived from Dynamic Capabilities Theory (DCT) and the Resource-Based View (RBV) (Barney, 1991; Teece et al., 1997).

A cross-sectional survey design was executed, wherein primary data were collected at a single point in time using a structured online questionnaire. This design is effective for capturing operational insights from geographically dispersed firms in a standardized manner. The unit of analysis for this research is at the organizational level. Data were solicited from key managerial informants, specifically supply chain managers, operations directors, halal executives, quality control managers, or managing directors who possess primary oversight regarding firm strategies, regulatory compliance, supplier interaction, and overall organizational performance (Subri & Omar, 2026).

Sampling and Data Collection

The target population comprised cosmetics manufacturing enterprises operating in Malaysia that are officially registered with the National Pharmaceutical Regulatory Agency (NPRA) under the Ministry of Health Malaysia. The NPRA registration serves as a critical benchmark, ensuring that all participating firms comply with national cosmetic safety standards, Good Manufacturing Practice (GMP), and halal production integrity.

A purposive sampling technique was employed in this study. A total of 313 invitations were distributed, and 205 responses were received. All 205 responses were retained as valid for data analysis. The response rate was therefore 65.50%, calculated as the number of responses received divided by the total number of invitations distributed and multiplied by 100. Accordingly, the final dataset consisted of 205 valid responses for subsequent analysis.

Measurement Instrument

The survey questionnaire was developed by adapting established, validated measurement scales from the literature to suit the operational context of the Malaysian halal cosmetics industry. The questionnaire comprised two main sections: Section A collected organizational demographic information, while Section B measured the core constructs of the research framework. To measure the government support variable, scale items were adapted from Tarmizi et al. (2021) to evaluate institutional assistance, regulatory guidance, infrastructure facilities, and financial incentives provided by relevant government agencies.

For the supplier capabilities variable, measurement items were adapted from Abdelilah et al. (2021) to assess vendor flexibility, quality compliance, joint problem-solving, and the ability to consistently supply halal-certified raw materials. Meanwhile, Halal Cosmetics Supply Chain Agility Practices (HCSCAP) were measured using scales adapted from Subri and Omar (2026) and Eckstein et al. (2015) to evaluate the organization's ability to rapidly respond to and reconfigure supply chain activities without compromising halal integrity.

To evaluate firm performance, this study conceptualized performance into two distinct dimensions: operational performance and financial performance. Operational performance was measured using items adapted from Abdelilah et al. (2021), focusing on non-financial indicators such as lead-time reduction, product quality consistency, delivery speed, and overall operational efficiency. Conversely, financial performance was measured using items adapted from Eckstein et al. (2015) and Subri and Omar (2026) to evaluate sales growth, profitability, market share, and return on investment (ROI). All measurement items were assessed using a seven-point Likert scale ranging from 1 (“Strongly Disagree”) to 7 (“Strongly Agree”). The seven-point response format was used consistently across the study constructs to capture respondents’ perceptions of government support, supplier capabilities, halal cosmetics supply chain agility practices, operational performance, and financial performance.

Analysis Technique (PLS-SEM)

Data analysis was conducted using Partial Least Squares Structural Equation Modelling (PLS-SEM) executed via SmartPLS software (Hair et al., 2021). PLS-SEM was selected over traditional covariance-based SEM (CB-SEM) because it is particularly well-suited for exploratory structural models, complex theoretical setups involving direct path relationships, and primary survey data that may exhibit non-normal distribution patterns (Hair et al., 2021). Furthermore, PLS-SEM maximizes the explained variance of target endogenous constructs,

making it an ideal variance-based analytical approach for predicting performance outcomes in supply chain research (Subri & Omar, 2026; Zainudin et al., 2026; Razi et al., 2026).

Following the standard two-step analytical framework recommended by Hair et al. (2021), the data evaluation process commenced with the assessment of the measurement model (outer model) to establish the construct reliability and validity. Internal consistency reliability was verified through Cronbach's alpha and Composite Reliability (CR) values exceeding the required threshold of 0.70. Convergent validity was assessed by ensuring that all item factor loadings exceeded 0.70 and that the Average Variance Extracted (AVE) for each latent construct surpassed the 0.50 cut-off limit. Discriminant validity was subsequently established using the Heterotrait-Monotrait ratio of correlations (HTMT), ensuring that all HTMT values remained well below the conservative threshold of 0.85 or 0.90, thereby confirming that each construct is empirically distinct within the structural framework.

Once the measurement model satisfied all evaluation criteria, the structural model (inner model) was evaluated to test the proposed direct hypotheses. Lateral collinearity was examined first by ensuring that Variance Inflation Factor (VIF) values for all predictor constructs remained below 5.0 (Hair et al., 2021). Path coefficients (β) and their statistical significance levels were derived using a non-parametric bootstrapping procedure with 5,000 resamples. Finally, the explanatory power and predictive capability of the structural model were evaluated through the coefficients of determination (R^2) and effect size f-squared (f^2) across all endogenous constructs, providing a rigorous statistical foundation for interpreting the empirical findings.

RESULTS AND DISCUSSION

Descriptive Statistics

The profile of the 205 surveyed organizations indicates that the majority are private limited companies (54.6%), followed by public limited organizations (22.0%), partnerships (16.1%), and sole traders (7.3%). In terms of company size, a substantial proportion are small-to-medium enterprises, with 81.4% employing fewer than 100 staff members and 15.6% employing between 100 and 500 workers. Regarding market reach, over half of the organizations operate predominantly within the domestic market (54.6%), while 24.0% serve all markets and 21.4% operate as multinationals. Furthermore, all participating firms possess significant operational experience, having been in business for 6 to 10 years (40.5%), 11 to 20 years (37.5%), or more than 20 years (22.0%). Geographically, the sample is primarily concentrated in Selangor (61.0%), with notable representation from Pulau Pinang (8.3%), Johor (6.8%), Kedah (6.8%), and Kuala Lumpur (4.9%). Finally, concerning financial capacity, the majority of firms report an annual sales turnover between RM1 million and RM10 million (66.3%), followed by RM11 million to RM25 million (19.5%), RM26 million to RM50 million (7.8%), and less than RM1 million (6.3%).

Assessment of the Measurement Model

As illustrated in Figure 1, the measurement model demonstrates strong indicator reliability and construct validity across all latent variables. Almost all indicator outer loadings comfortably exceeded the recommended threshold of 0.708 (ranging from 0.752 to 0.987), with only HCSAP6 showing a slightly lower loading of 0.648, which was retained as its inclusion did not compromise composite reliability or convergent validity. Furthermore, the structural model demonstrates satisfactory predictive power across the endogenous constructs.

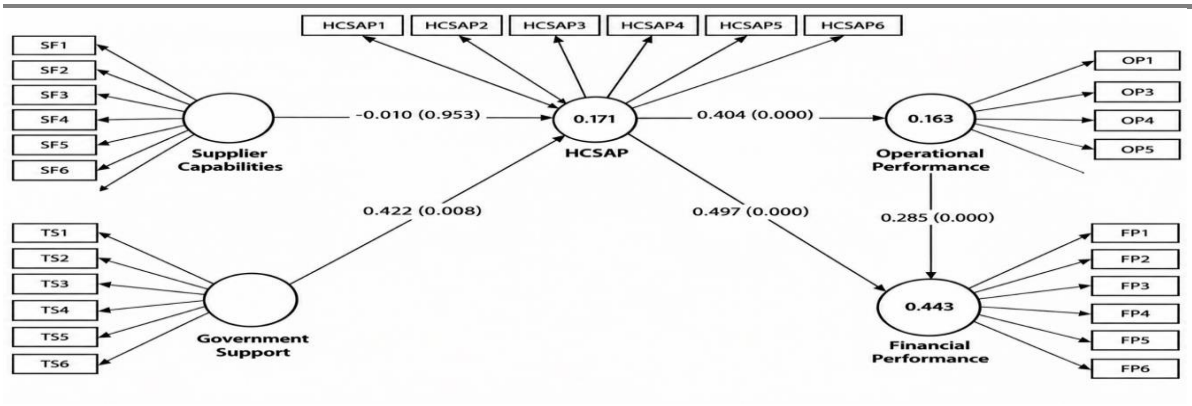


Figure 1. Final Measurement Model

To establish the reliability and convergent validity of the measurement model, two low-performing items, SF7 (Supplier Capabilities) and OP2 (Operational Performance), were removed because their outer loadings fell below the 0.60 threshold. As shown in Table 1, all remaining indicator loadings exceeded acceptable limits (ranging from 0.648 to 0.987). Construct reliability was confirmed, with Cronbach's alpha (0.941 to 0.987) and Composite Reliability (0.954 to 0.990) values for all constructs well above the 0.70 benchmark. Additionally, convergent validity was established, as the Average Variance Extracted (AVE) for each variable ranged between 0.776 and 0.962, easily surpassing the minimum threshold of 0.50.

Table 1. The Internal Reliability and Convergent Validity Analysis

Variables	Items	Loading	Internal Reliability		Convergent Validity
			Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Financial Performance	FP1	0.969	0.964		
	FP2	0.928		0.971	0.847
	FP3	0.937			
	FP4	0.92			
	FP5	0.854			
	FP6	0.912			
Operational Performance	OP1	0.983	0.987		
	OP3	0.985		0.99	0.962
	OP4	0.987			
	OP5	0.969			
HCSAP	HCSAP1	0.943	0.946		
	HCSAP2	0.919		0.957	0.79
	HCSAP3	0.897			
	HCSAP4	0.95			
	HCSAP5	0.938			
	HCSAP6	0.648			
Supplier Capabilities	SF1	0.83	0.941		
	SF2	0.796		0.954	0.776
	SF3	0.933			
	SF4	0.899			
	SF5	0.932			
	SF6	0.885			
Government Support	TS1	0.785	0.943		
	TS2	0.953		0.956	0.784

	TS3	0.969			
	TS4	0.851			
	TS5	0.976			
	TS6	0.752			

Discriminant validity, as shown in Table 2, was assessed using the Fornell–Larcker criterion and the Heterotrait–Monotrait ratio (HTMT). Based on the Fornell–Larcker criterion, the square root of the average variance extracted (AVE) for each construct was greater than its correlations with the other constructs, indicating adequate discriminant validity. The diagonal values ranged from 0.881 to 0.981, exceeding the corresponding inter-construct correlations.

The HTMT results further supported discriminant validity, with values ranging from 0.208 to 0.849. All HTM

T values were below the conservative threshold of 0.85. Overall, the findings provide evidence of discriminant validity among the five constructs, confirming that the constructs are empirically distinguishable from one another.

Table 2. Discriminant Validity Assessment

Structural Relationship	HTMT point estimate	95% Confidence Interval		Result
		Lower	Upper	
Supplier Capabilities -> HCSAP	0.318	0.151	0.491	Establish
Government Support -> HCSAP	0.384	0.207	0.553	Establish
HCSAP -> Operational Performance	0.404	0.276	0.526	Establish
HCSAP -> Financial Performance	0.573	0.401	0.709	Establish
Operational Performance -> Financial Performance	0.486	0.392	0.709	Establish

Note: HCSAP= Halal Cosmetics Supply Agility Practices.

Assessment of the Structural Model

Lateral collinearity was evaluated before hypothesis testing. All Variance Inflation Factor (VIF) values ranged between 1.000 and 2.792, remaining well below the threshold of 5.0, confirming the absence of multicollinearity among the structural predictors (Hair et al., 2021; Kock, 2015).

As shown in Figure 1 and Table 3, the structural path assessment reveals that Government Support significantly and positively drives Halal Cosmetics Supply Chain Agility Practices (HCSCAP) (β = 0.422, p = 0.008, f^2 = 0.077), supporting H2. Conversely, Supplier Capabilities do not exert a statistically significant influence on HCSCAP(β = -0.010, p = 0.953, f^2= 0.000), leading to the rejection of H1. Together, the structural predictors account for 17.1% (R^2 = 0.171) of the total variance in HCSCAP.

Regarding organizational outcomes, HCSCAP significantly exerts a direct positive influence on Operational Performance (β = 0.404, p < 0.001, f^2 = 0.195), supporting H3 and explaining 16.3% (R^2 = 0.163) of its variance (Abdelilah et al., 2021). Furthermore, HCSCAP serves as a strong primary determinant of Financial Performance (β = 0.497, p < 0.001, f^2 = 0.371), supporting H4 with a large effect size (Cohen, 1988; Eckstein et al., 2015). Operational Performance also significantly enhances Financial Performance (β = 0.285, p < 0.001, f^2 = 0.122), supporting H5. Concurrently, HCSCAP and Operational Performance explain a substantial 44.3% (R^2 = 0.443) of the variance in manufacturers' Financial Performance (Subri & Omar, 2026).

Table 3. Structural Model Evaluation and Hypothesis Testing Summary

Structural Relationship	Path (β)	Sample Mean (SE)	Effect Size (f^2)	t-value	P-value	Decision
Supplier Capabilities -> HCSAP	-0.01	-0.015	0	0.059	0.953*	Not Significant
Government Support -> HCSAP	0.422	0.432	0.077	2.651	0.008*	Significant
HCSAP -> Operational Performance	0.404	0.404	0.195	6.517	0.001*	Significant
HCSAP -> Financial Performance	0.497	0.495	0.371	8.434	0.001*	Significant
Operational Performance -> Financial Performance	0.285	0.286	0.122	6.797	0.001*	Significant

Note: HCSAP= Halal Cosmetics Supply Agility Practices. Statistically significant at $p < 0.01$.

DISCUSSION, IMPLICATION & CONCLUSION

Discussion of Findings

Several limitations should be considered when interpreting the findings. First, the purposive sampling approach and online questionnaire distribution may have introduced selection bias, limiting the extent to which the findings can be generalized to all cosmetics manufacturers in Malaysia. Second, the cross-sectional design captures the relationships among the study constructs at a single point in time and therefore does not establish temporal precedence or definitive causality. Third, the reliance on self-reported data from organizational informants may introduce common method bias and perceptual measurement limitations, despite the additional assessment undertaken. Future studies could use longitudinal designs, probability-based sampling where feasible, and data from multiple informants or objective organizational records to strengthen the robustness and generalizability of the findings.

Theoretical and Managerial Implications

Theoretically, this study contributes to the supply chain literature by validating the application of DCT and RBV within the high-compliance halal cosmetics industry. It clarifies that external institutional drivers play a more direct role than raw vendor capabilities in establishing agility. Managerially, cosmetics industry practitioners should focus on internal agility routines and active engagement with government assistance programs rather than relying solely on upstream supplier readiness.

Policy Implications

The significant positive relationship between government support and halal cosmetics supply chain agility practices suggests that policymakers may consider strengthening accessible regulatory guidance, capability-building programmes, and support mechanisms for cosmetics manufacturers. Such initiatives should be designed to help firms respond more effectively to supply chain changes while maintaining halal-related requirements. However, the non-significant direct relationship between supplier capabilities and agility indicates that supplier development initiatives should not be assumed to improve agility automatically. Instead, programmes could also encourage collaboration, information sharing, and coordination between manufacturers and suppliers. These recommendations should be interpreted as practical implications of the observed relationships rather than as evidence that any specific policy intervention has already been proven effective by this study.

Conclusion

In conclusion, this research empirically validates that institutional government support acts as a pivotal catalyst for halal cosmetics supply chain agility, which in turn significantly drives both operational efficiency and financial profitability. By translating institutional facilitation into dynamic operational agility, Malaysian

cosmetics manufacturers can achieve sustainable competitive advantage and support national economic priorities.

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