

The Effect of Supply Chain Integration, Management Commitment, and Sustainable Supply Chain Practices on the Performance of Craft MSMEs in Bantul Regency

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ARTICLE INFORMATION

Publication information

Research article

HOW TO CITE

Antoro, L., Kusmantini, T., & Nilmawati. (2025). *The effect of supply chain integration, management commitment, and Sustainable Supply Chain Practices (SSCP) as a sustainable supply chain practices on the performance of craft MSMEs in Bantul Regency. Journal of International Conference Proceedings*, 8(6), 98–116.

DOI:

<https://doi.org/10.32535/jicp.v8i6.4784>

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Published by JICP



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Received: 10 December 2025

Accepted: 12 January 2026

Published: 14 February 2026

ABSTRACT

This study examines the effects of Supply Chain Integration (SCI) and Management Commitment (MC) on the performance of handicraft MSMEs in Bantul Regency. Drawing on the Natural Resource-Based View and Dynamic Capabilities Theory, the study investigates the role of Sustainable Supply Chain Practices (SSCP) as a mediating variable and Supply Chain Challenges (SCC) as a moderating variable. A quantitative approach was employed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) based on survey data collected from 100 owners and managers of verified handicraft MSMEs in Bantul Regency, Indonesia. The results indicate that Supply Chain Integration and Management Commitment have significant positive effects on both Sustainable Supply Chain Practices and MSME performance. Sustainable Supply Chain Practices also have a significant positive effect on MSME performance. However, SSCP does not significantly mediate the relationships between SCI, MC, and MSME performance. Furthermore, Supply Chain Challenges significantly moderate the relationship between SSCP and MSME performance.

Keywords: Handicraft Msme; Management Commitment; Performance; Supply Chain Integration; Sustainable Supply Chain Practices.

INTRODUCTION

The global expansion of the creative economy has repositioned Micro, Small, and Medium Enterprises (MSMEs) as critical drivers of employment generation, inclusive growth, and cultural sustainability. Within this landscape, craft-based MSMEs play a unique economic role by transforming cultural heritage into marketable value. However, despite their strategic importance, these enterprises continue to operate under structural constraints, including limited technological capability, fragmented supply networks, and managerial informality. These conditions not only constrain competitiveness but also intensify vulnerability in the face of increasing global competition and rising environmental expectations.

In parallel with these structural challenges, sustainability has emerged as a dominant paradigm in contemporary supply chain governance. Firms are no longer evaluated solely based on efficiency and responsiveness but increasingly on environmental responsibility, social accountability, and long-term value creation. Sustainable Supply Chain Management (SSCM) reflects this paradigm shift by integrating economic, ecological, and social objectives into operational decision-making. While SSCM literature largely assumes that sustainability functions as a source of competitive advantage, this assumption is derived primarily from studies conducted in large organizations operating within highly formalized institutional environments.

Supply Chain Integration (SCI) has long been positioned as a strategic enabler of both operational efficiency and sustainability. Through mechanisms such as collaborative planning, information sharing, and coordinated logistics, SCI is theorized to enhance performance by reducing uncertainty and transaction costs. However, empirical findings regarding the performance implications of integration remain mixed in MSME contexts, particularly in sectors characterized by artisanal production, informal governance structures, and volatile demand. Integration in such environments requires not only coordination mechanisms but also managerial commitment and organizational readiness to translate integration efforts into performance outcomes.

Management Commitment (MC) has received growing attention as a determinant of sustainability orientation. In MSMEs, where ownership and control are often concentrated in a single individual, leadership commitment becomes the primary mechanism shaping strategic priorities and resource allocation. Managerial values and cognitive frames determine whether sustainability remains symbolic or becomes embedded in organizational routines. Consequently, management commitment is expected to play a pivotal role in encouraging the adoption of sustainable supply chain practices and improving organizational performance.

Sustainable Supply Chain Practices (SSCP) represent the operational manifestation of sustainability strategies and encompass activities such as responsible sourcing, waste minimization, and ethical labor management. These practices have increasingly been recognized as important mechanisms for enhancing organizational legitimacy, resilience, and long-term performance. Nevertheless, empirical evidence regarding their mediating role between organizational capabilities and performance remains inconclusive, particularly within MSMEs operating in developing economies.

Against this backdrop, three critical gaps motivate this study. First, sustainability-driven supply chain research within creative MSMEs remains underdeveloped relative to large-scale manufacturing contexts. Second, the mediating role of SSCP in linking supply chain integration and management commitment to performance has received limited empirical attention. Third, existing SSCM studies have not sufficiently considered the

influence of supply chain challenges that may strengthen or weaken the effectiveness of sustainability practices in improving firm performance. Although previous studies generally report positive relationships between supply chain integration, sustainability practices, and firm performance, limited evidence is available regarding how these relationships operate simultaneously in handicraft MSMEs within emerging economies. In addition, the mediating role of Sustainable Supply Chain Practices and the moderating role of Supply Chain Challenges remain insufficiently explored in the MSME context

Accordingly, this study investigates the relationships between Supply Chain Integration, Management Commitment, Sustainable Supply Chain Practices, and MSME performance in the handicraft sector of Bantul Regency, Indonesia. Drawing upon the Natural Resource-Based View (NRBV) and Dynamic Capabilities Theory, the study examines how internal organizational capabilities and sustainability-oriented practices contribute to MSME performance under varying supply chain conditions. In addition, the study incorporates Supply Chain Challenges as a moderating variable to capture the contextual realities faced by MSMEs in emerging economies.

This study contributes to the Sustainable Supply Chain Management (SSCM) literature in three ways. First, it provides empirical evidence that Supply Chain Integration, Management Commitment, and Sustainable Supply Chain Practices significantly improve MSME performance in the handicraft sector. Second, the study demonstrates that Sustainable Supply Chain Practices do not mediate the relationships between Supply Chain Integration, Management Commitment, and MSME performance, suggesting that these organizational capabilities contribute to performance primarily through direct mechanisms. Third, by incorporating Supply Chain Challenges as a moderating variable, this study highlights the contextual conditions under which sustainability-oriented practices become more effective in enhancing MSME performance.

Although previous studies have examined the relationships between supply chain integration, sustainable supply chain management, and organizational performance, most empirical evidence has been derived from large manufacturing firms operating in developed economies. Limited studies have simultaneously investigated the direct effects of Supply Chain Integration and Management Commitment, the mediating role of Sustainable Supply Chain Practices, and the moderating role of Supply Chain Challenges within handicraft MSMEs in emerging economies.

Therefore, this study offers three principal contributions. First, it extends the application of the Natural Resource-Based View and Dynamic Capabilities Theory to creative-industry MSMEs. Second, it develops an integrated research model by examining Sustainable Supply Chain Practices as a mediator and Supply Chain Challenges as a moderator within a single structural framework. Third, it provides empirical evidence from handicraft MSMEs in Bantul Regency, Indonesia, where sustainable supply chain research remains relatively limited.

LITERATURE REVIEW

Supply Chain Management and Theoretical Foundations

Supply Chain Management (SCM) has evolved from an operational coordination function into a strategic architecture shaping firm competitiveness (Chopra & Meindl, 2023; Heizer et al., 2023). Recent research positions sustainability as a central pillar of supply chain strategy rather than a peripheral operational concern (Klassen & Vereecke, 2022; Melnyk et al., 2022). The Natural Resource-Based View (NRBV) extends classical resource-based logic by identifying environmental and sustainability-oriented capabilities

as strategic resources that can generate sustainable competitive advantage (Bansal et al., 2022). Within the NRBV framework, sustainable practices are not merely compliance mechanisms but organizational capabilities that contribute to long-term performance and competitiveness. Nevertheless, empirical validations of NRBV are predominantly drawn from large organizations operating in formal institutional environments, raising questions about its applicability to MSMEs in emerging markets (Lee et al., 2023; Masudin et al., 2024).

Dynamic Capabilities Theory complements NRBV by emphasizing how organizations transform resources into performance through sensing, seizing, and reconfiguring processes (Teece, 2024). While large enterprises institutionalize these processes through routines and digital infrastructure, MSMEs depend heavily on managerial discretion, leadership commitment, and informal organizational practices (Handfield et al., 2023). Consequently, leadership commitment may function as a critical capability that enables MSMEs to adopt sustainability-oriented practices and respond effectively to environmental and market changes.

Supply Chain Integration as a Strategic Capability

Supply Chain Integration (SCI) has been widely conceptualized as a strategic capability that improves information flow, coordination, and organizational performance (Chopra & Meindl, 2024; Ivanov & Dolgui, 2022). Empirical studies in developed economies consistently associate SCI with operational efficiency, responsiveness, and competitive advantage (Gunasekaran et al., 2022). Through collaborative planning, information sharing, and coordinated logistics, SCI can reduce uncertainty and transaction costs while enhancing organizational adaptability.

However, the effectiveness of SCI may vary across organizational contexts. MSMEs often operate under conditions of limited resources, informal coordination, and fragmented supply networks, which may constrain the implementation of integration initiatives (Masudin et al., 2024). Therefore, further empirical investigation is needed to understand how SCI contributes to sustainability practices and performance outcomes in resource-constrained enterprises, particularly within creative industries.

Sustainable Supply Chain Practices: Capability and Performance Driver

Sustainable Supply Chain Practices (SSCP) encompass activities such as responsible sourcing, energy efficiency, waste reduction, and ethical labor management (Seuring & Müller, 2023). These practices operationalize sustainability objectives by integrating environmental, social, and economic considerations into supply chain activities. Existing studies suggest that sustainability-oriented practices can enhance organizational legitimacy, resilience, and long-term competitiveness (Rad et al., 2022; Zhou et al., 2023).

Despite these benefits, MSMEs frequently encounter financial, technological, and managerial constraints that limit the adoption of sustainability initiatives (Lee et al., 2023). Nevertheless, increasing evidence indicates that sustainability-oriented practices can contribute positively to organizational performance when effectively implemented. Consequently, SSCP may serve both as an operational capability and as a strategic mechanism for improving business outcomes.

Management Commitment as a Strategic Enabler

Management Commitment (MC) significantly influences sustainability adoption, organizational change, and supply chain coordination (Ali et al., 2022; Handfield et al., 2023). In MSMEs, where strategic authority is highly centralized, managerial commitment plays a decisive role in determining organizational priorities and resource

allocation (David et al., 2023). From a Dynamic Capabilities perspective, management commitment enables firms to sense opportunities, mobilize resources, and institutionalize sustainability-oriented practices (Teece, 2024). Accordingly, managerial commitment is expected to strengthen the implementation of sustainable supply chain practices and improve organizational performance. Its strategic importance is particularly relevant in MSMEs, where leadership often substitutes for formal organizational systems and routines.

Supply Chain Challenges as Contextual Constraints

Supply chain systems are increasingly shaped by global disruption, regulatory pressure, and demand uncertainty (Ivanov et al., 2022; Simchi-Levi et al., 2023). MSMEs face intensified vulnerability due to resource scarcity and weak bargaining power (Christopher, 2020). Under such constraints, sustainability initiatives may either act as resilience buffers or become economically unsustainable (Tang & Musa, 2021). This dual role warrants conceptualizing supply chain challenges as a moderating variable rather than background noise.

MSME Performance as Multidimensional Outcome

MSME performance extends beyond financial results and includes flexibility, innovation, and market responsiveness (Chopra & Meindl, 2024; Kaplan, 2020). In creative industries, performance also involves cultural value and brand legitimacy (Mentzer et al., 2022). This reinforces the necessity of mediation-based models rather than direct linear causation between sustainability and performance.

Hypotheses Development

Drawing on the Natural Resource-Based View (NRBV) and Dynamic Capabilities Theory, this study conceptualizes Supply Chain Integration (SCI) and Management Commitment (MC) as strategic drivers of organizational performance, with Sustainable Supply Chain Practices (SSCP) serving as a mechanism through which sustainability-oriented capabilities are operationalized. Furthermore, Supply Chain Challenges (SCC) are expected to influence the effectiveness of sustainability practices in improving MSME performance.

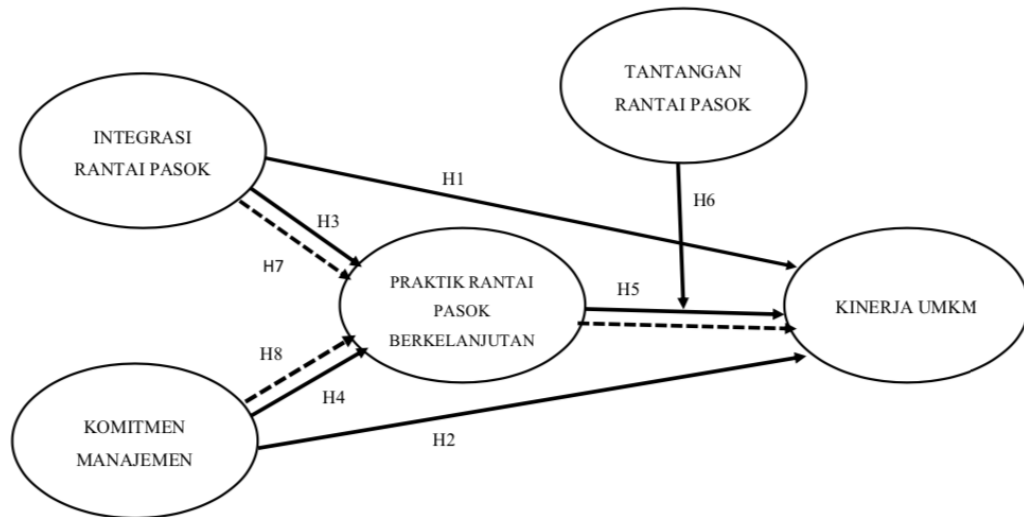
Accordingly, the following hypotheses are formulated:

- H1:** Supply chain integration has a positive effect on MSME performance.
- H2:** Management commitment has a positive effect on MSME performance.
- H3:** Supply chain integration has a positive effect on sustainable supply chain practices.
- H4:** Management commitment has a positive effect on sustainable supply chain practices.
- H5:** Sustainable supply chain practices have a positive effect on MSME performance.
- H6:** Supply chain challenges moderate the relationship between sustainable supply chain practices and MSME performance.
- H7:** Sustainable supply chain practices mediate the relationship between supply chain integration and MSME performance.
- H8:** Sustainable supply chain practices mediate the relationship between management commitment and MSME performance.

Conceptual Framework

The study framework model is depicted in Figure 1.

Figure 1. Research Framework



RESEARCH METHOD

This study employed a cross-sectional quantitative design to examine the relationships among Supply Chain Integration (SCI), Management Commitment (MC), Sustainable Supply Chain Practices (SSCP), Supply Chain Challenges (SCC), and MSME performance in the handicraft sector of Bantul Regency, Indonesia. Bantul was selected due to its prominence as a center of creative and handicraft-based MSMEs.

The population consisted of handicraft MSMEs registered in Bantul Regency. Following a verification process, 100 active MSMEs that met the established research criteria were selected using purposive sampling. The unit of analysis was the individual MSME, represented by owners or managers directly involved in operational and strategic decision-making.

Primary data were collected through a structured questionnaire using a five-point Likert scale ranging from strongly disagree to strongly agree. Prior to analysis, the responses were screened to ensure completeness and consistency. The measurement instruments assessed Supply Chain Integration, Management Commitment, Sustainable Supply Chain Practices, Supply Chain Challenges, and MSME performance using indicators adapted from established studies. Data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 to evaluate the measurement model and test the hypothesized relationships among variables.

Table 1. Operational Definition of Variabels

Variable	Dimension/Indicator	Source
Supply Chain Integration (SCI)	Information sharing, supplier collaboration, customer integration, coordination, operational synchronization	Masudin et al. (2024); Chopra & Meindl (2024)
Management Commitment (MC)	Leadership support, sustainability commitment,	Ali et al. (2022);

	resource allocation, strategic direction, organizational encouragement	Handfield et al. (2023)
Sustainable Supply Chain Practices (SSCP)	Responsible sourcing, waste reduction, environmental management, resource efficiency, social responsibility	Seuring & Müller (2023); Rad et al. (2022)
Supply Chain Challenges (SCC)	Supply uncertainty, logistics disruption, demand fluctuation, cost pressure, operational risk	Ivanov & Dolgui (2022); Simangunsong et al. (2022)
MSME Performance	Sales growth, profitability, operational efficiency, market performance, business sustainability	Kaplan (2020); Mentzer et al. (2022)

RESULTS

The data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 to evaluate both the measurement model and the structural model. The analysis began with descriptive statistics, followed by reliability and validity assessments to ensure the adequacy of the measurement instruments. Subsequently, the structural model was evaluated to test the proposed hypotheses and examine the relationships among the constructs.

Since all data were collected using a single survey instrument, common method bias was assessed to ensure that the observed relationships were not substantially influenced by measurement method effects. Following the recommendations of Kock (2021), full collinearity variance inflation factor (VIF) values were examined. All VIF values were below the recommended threshold of 3.3, indicating that common method bias is unlikely to be a serious concern in this study.

Respondent Profile

A total of 100 handicraft MSMEs located in Bantul Regency participated in this study. The respondents consisted of MSME owners and managers who were directly involved in operational and strategic decision-making. The profile of respondents was analyzed to provide an overview of the characteristics of the participating enterprises.

The demographic and business characteristics of the respondents, including gender, age, educational background, business age, number of employees, and type of handicraft business. Understanding these characteristics is important because they may influence managerial commitment, supply chain integration, and sustainability-oriented practices implemented by MSMEs. The descriptive results indicate that most respondents have extensive experience in managing their businesses and operate within small-scale organizational structures. These characteristics are consistent with the general profile of handicraft MSMEs in Indonesia, where managerial authority is highly centralized and strategic decisions are predominantly made by business owners.

Measurement Model Evaluation.

The measurement model demonstrated satisfactory psychometric properties. Convergent validity was confirmed as all factor loadings exceeded the recommended threshold and Average Variance Extracted (AVE) values were above 0.50. Reliability testing showed that Cronbach's Alpha and Composite Reliability values exceeded 0.70, indicating strong internal consistency. Discriminant validity was also established using

the Heterotrait–Monotrait Ratio (HTMT), with all values below the recommended threshold. Overall, the measurement model met the required validity and reliability criteria.

Structural Model Results.

The structural model results indicate that Supply Chain Integration has a significant positive effect on both Sustainable Supply Chain Practices and MSME performance. Likewise, Management Commitment significantly and positively influences Sustainable Supply Chain Practices and MSME performance. Sustainable Supply Chain Practices also demonstrate a significant positive effect on MSME performance, highlighting the importance of sustainability-oriented activities in enhancing business outcomes.

However, the indirect effects of Supply Chain Integration and Management Commitment on MSME performance through Sustainable Supply Chain Practices are not significant, indicating that SSCP does not mediate these relationships. Furthermore, Supply Chain Challenges significantly moderate the relationship between Sustainable Supply Chain Practices and MSME performance, suggesting that the effectiveness of sustainability-oriented practices depends on the level of supply chain challenges faced by MSMEs.

Model Explanatory Power.

The coefficient of determination (R^2) indicates that Supply Chain Integration and Management Commitment explain a substantial proportion of variance in Sustainable Supply Chain Practices. In addition, the model demonstrates moderate explanatory power for MSME performance, suggesting that while the examined variables play important roles, other organizational and environmental factors may also influence performance outcomes.

Interpretation Summary.

Overall, the findings demonstrate that Supply Chain Integration, Management Commitment, and Sustainable Supply Chain Practices are important drivers of MSME performance. While Sustainable Supply Chain Practices contribute directly to performance improvement, they do not mediate the effects of Supply Chain Integration and Management Commitment. Moreover, the significant moderating role of Supply Chain Challenges highlights the importance of contextual conditions in determining the effectiveness of sustainability-oriented practices within MSMEs.

Table Format

Statistical Results

Table 2. Construct Reliability and Convergent Validity

Variable	CA	CR	CR
Supply Chain Integration (SCI)	0.908	0.931	0.685
Management Commitment (MC)	0.883	0.915	0.685
MSME Performance	0.879	0.913	0.679
Sustainable Supply Chain Practices (SSCP)	0.882	0.912	0.677
Supply Chain Challenges (SCC)	0.893	0.914	0.682

As presented in Table 1, Cronbach's Alpha values ranged from 0.879 to 0.908, Composite Reliability ranged from 0.912 to 0.931, and AVE ranged from 0.677 to 0.732. All values exceeded the recommended thresholds, confirming satisfactory internal consistency and convergent validity.

Table 3. HTMT Matrix

Variable	ISC	CR	MP	SSCP	SCC
Supply Chain Integration (SCI)	-				
Management Commitment (MC)	0.816	-			
MSME Performance (MP)	0.754	0.756	-		
Sustainable Supply Chain Practices (SSCP)	0.635	0.711	0.554	-	
Supply Chain Challenges (SCC)	0.293	0.305	0.306	0.245	-

Note: All HTMT values are below the recommended threshold of 0.90 (Hair et al., 2022).

Table 4. Cross Loading Discriminant Validity Result

Indicator	IRP	KM	KU	PRPB	TRP	Remarks.
IRP1	0,898	0,676	0,623	0,576	0,249	Valid
IRP2	0,888	0,607	0,608	0,519	0,354	Valid
IRP3	0,877	0,761	0,699	0,603	0,217	Valid
IRP4	0,866	0,603	0,546	0,490	0,270	Valid
IRP5	0,737	0,528	0,406	0,415	0,268	Valid
KM1	0,427	0,734	0,387	0,400	0,288	Valid
KM2	0,729	0,904	0,683	0,574	0,244	Valid
KM3	0,711	0,732	0,632	0,528	0,095	Valid
KM4	0,586	0,889	0,555	0,624	0,195	Valid
KM5	0,594	0,862	0,497	0,613	0,360	Valid
KU1	0,622	0,572	0,910	0,480	0,276	Valid
KU2	0,495	0,467	0,737	0,262	0,351	Valid
KU3	0,522	0,513	0,738	0,430	0,218	Valid
KU4	0,549	0,620	0,803	0,517	0,249	Valid
KU5	0,627	0,611	0,914	0,521	0,268	Valid
PRPB1	0,562	0,611	0,536	0,867	0,232	Valid
PRPB2	0,372	0,389	0,203	0,722	0,048	Valid
PRPB3	0,250	0,340	0,206	0,722	0,094	Valid
PRPB4	0,684	0,727	0,579	0,954	0,028	Valid
PRPB5	0,497	0,541	0,510	0,824	0,310	Valid
TRP1	0,355	0,319	0,368	0,013	0,921	Valid
TRP2	0,329	0,291	0,341	0,083	0,873	Valid
TRP3	0,202	0,127	0,128	0,144	0,760	Valid
TRP4	0,094	0,129	0,180	0,169	0,795	Valid
TRP5	0,108	0,068	0,081	0,203	0,770	Valid

According to the data in Table 1, all measurement indicators demonstrate satisfactory convergent validity, as all outer loading values exceed the recommended threshold of 0.70. This indicates that each item is strongly associated with its respective construct and confirms that the indicators are capable of adequately measuring the underlying variables.

Table 5. Cronbach's Alpha Result

Variable	Cronbach's Alpha	Remarks
Supply Chain Integration	0,908	Reliable
Management Commitment	0,883	Reliable
Sustainable Supply Chain Practices	0,879	Reliable
MSME Performance	0,882	Reliable
Supply Chain Challenges	0,893	Reliable

According to Table 2, all constructs in the model exhibit Cronbach's Alpha values above the minimum threshold of 0.70, indicating that the measurement instruments are reliable and demonstrate satisfactory internal consistency. These results confirm that the indicators consistently measure their respective constructs and that the scales used in this study are suitable for further statistical analysis.

Table 6. R-Square

Variable	R-square	R-square adjusted
MSME Performance	0,574	0,551
Sustainable Supply Chain Practices	0,479	0,468

The coefficient of determination (R^2) indicates that the proposed model has moderate explanatory power. MSME Performance has an R^2 value of 0.574, indicating that 57.4 percent of the variance in MSME performance can be explained by Supply Chain Integration, Management Commitment, Sustainable Supply Chain Practices, Supply Chain Challenges, and the interaction effect included in the model. In addition, Sustainable Supply Chain Practices exhibit an R^2 value of 0.479, suggesting that Supply Chain Integration and Management Commitment explain 47.9 percent of the variance in sustainability-oriented practices. These findings demonstrate that the proposed model provides a substantial explanation of the endogenous constructs while indicating that other organizational and environmental factors may also contribute to MSME performance.

Q-Square

$$Q^2 = 1 - (1 - R1^2)(1 - R2^2)$$

With the following R-square values:

$$R1^2 \text{ (MSME Performance)} = 0,574$$

$$R2^2 \text{ (Sustainable Supply Chain Practices)} = 0,479$$

the calculation is as follows:

$$Q^2 = 1 - (1 - R1^2)(1 - R2^2)$$

$$Q^2 = 1 - (1 - 0,574)(1 - 0,479)$$

$$Q^2 = 1 - 0,221946$$

$$Q^2 = 0,778054$$

Based on the Q-square calculation using the R-square values of MSME performance (0.574) and sustainable supply chain practices (0.479), the model yields a Q² value of 0.778054. This result indicates strong predictive relevance. According to Hair et al. (2021), Q-square values above 0.35 reflect high predictive capability, suggesting that the proposed model has substantial predictive power.

Table 7. Path Coefficient Direct Effect

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Expl.
Supply Chain Integration -> MSME Performance	0,258	0,259	0,118	2,193	0,028	supported
Supply Chain Integration -> Sustainable Supply Chain Practices	0,257	0,270	0,121	2,129	0,033	supported
Management Commitment -> MSME Performance	0,347	0,343	0,118	2,936	0,003	supported
Management Commitment -> Sustainable Supply Chain Practices	0,478	0,467	0,115	4,158	0,000	supported
Sustainable Supply Chain Practices -> MSME Performance	0,218	0,125	0,105	2,074	0,028	supported
Supply Chain Challenges -> MSME Performance	0,196	0,202	0,073	2,673	0,008	supported
Supply Chain Challenges × Sustainable Supply Chain Practices → MSME Performance	0,180	0,185	0,074	2,429	0,015	supported

Table 8. Path Coefficient Indirect Effect

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Expl.

Supply Chain Integration → Sustainable Supply Chain Practices → MSME Performance	0,056	0,057	0,039	1,424	0,154	not supported
Management Commitment → Sustainable Supply Chain Practices → MSME Performance	0,104	0,101	0,056	1,868	0,062	not supported

The results presented in Table 4 indicate that most of the proposed direct relationships are statistically significant. The first hypothesis test shows that Supply Chain Integration has a significant positive effect on MSME performance ($\beta = 0.258$; $T = 2.193$; $p = 0.028$), supporting H1. The second hypothesis also confirms that Supply Chain Integration significantly and positively influences Sustainable Supply Chain Practices ($\beta = 0.257$; $T = 2.129$; $p = 0.033$), supporting H3. Likewise, Management Commitment has a significant positive effect on MSME performance ($\beta = 0.343$; $T = 2.936$; $p = 0.003$), providing support for H2. The fourth hypothesis is also supported, as Management Commitment significantly influences Sustainable Supply Chain Practices ($\beta = 0.478$; $T = 4.158$; $p = 0.000$).

Furthermore, Sustainable Supply Chain Practices have a significant positive effect on MSME performance ($\beta = 0.218$; $T = 2.074$; $p = 0.028$), supporting H5.

The moderation analysis reveals that Supply Chain Challenges have a significant positive direct effect on MSME performance ($\beta = 0.196$; $T = 2.673$; $p = 0.008$). In addition, the interaction effect between Supply Chain Challenges and Sustainable Supply Chain Practices is significant ($\beta = 0.180$; $T = 2.429$; $p = 0.015$), indicating that Supply Chain Challenges significantly moderate the relationship between Sustainable Supply Chain Practices and MSME performance. Therefore, H6 is supported.

The mediation analysis shows that Sustainable Supply Chain Practices do not significantly mediate the relationship between Supply Chain Integration and MSME performance ($\beta = 0.056$; $T = 1.424$; $p = 0.154$). Similarly, the indirect effect of Management Commitment on MSME performance through Sustainable Supply Chain Practices is not significant ($\beta = 0.104$; $T = 1.868$; $p = 0.062$). Accordingly, H7 and H8 are not supported.

Figure Format

Figure 2. Overview Result

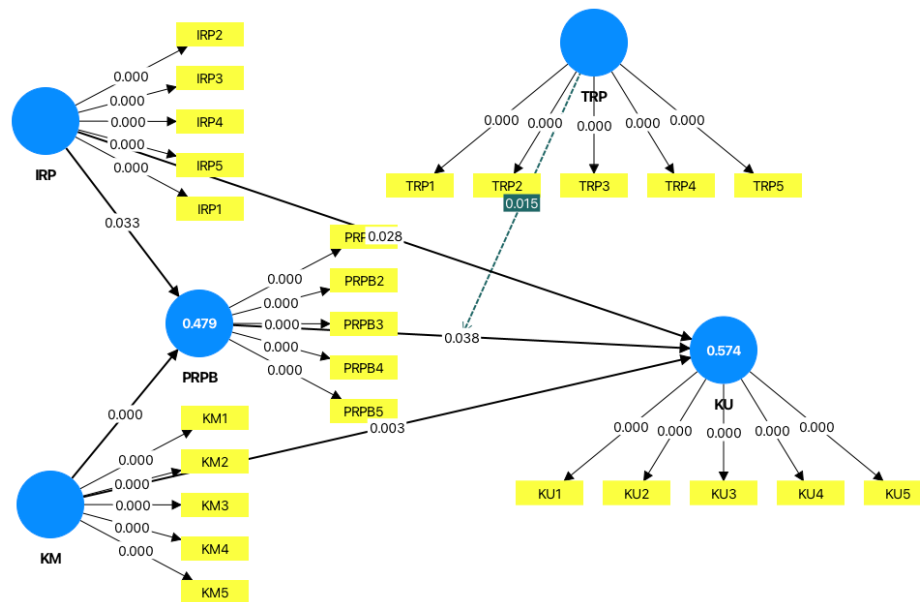


Figure 2 presents the structural model estimated using PLS-SEM. The results show that Supply Chain Integration and Management Commitment have significant positive effects on Sustainable Supply Chain Practices, with Management Commitment demonstrating the strongest influence ($\beta = 0.478$; $p < 0.001$). Supply Chain Integration also significantly affects Sustainable Supply Chain Practices ($\beta = 0.257$; $p = 0.033$).

Furthermore, Supply Chain Integration ($\beta = 0.258$; $p = 0.028$), Management Commitment ($\beta = 0.343$; $p = 0.003$), and Sustainable Supply Chain Practices ($\beta = 0.218$; $p = 0.028$) significantly and positively influence MSME Performance. Supply Chain Challenges also have a significant direct effect on MSME Performance ($\beta = 0.196$; $p = 0.008$) and significantly moderate the relationship between Sustainable Supply Chain Practices and MSME Performance ($\beta = 0.180$; $p = 0.015$).

The model explains 47.9% of the variance in Sustainable Supply Chain Practices and 57.4% of the variance in MSME Performance, indicating moderate explanatory power. Overall, the findings highlight the importance of supply chain integration, management commitment, and sustainability-oriented practices in improving MSME performance under varying supply chain conditions.

DISCUSSION

This study contributes to the sustainable supply chain management literature in several important ways. First, the findings extend the application of the Natural Resource-Based View (NRBV) by demonstrating that Supply Chain Integration and Management Commitment function as strategic organizational resources that facilitate the implementation of Sustainable Supply Chain Practices among handicraft MSMEs. The results suggest that sustainability-oriented capabilities are not only relevant for large organizations but also for small and medium-sized enterprises operating in resource-constrained environments.

Second, this study extends Dynamic Capabilities Theory by demonstrating that Sustainable Supply Chain Practices contribute directly to MSME performance, although they do not significantly mediate the relationships between Supply Chain Integration, Management Commitment, and MSME performance. This finding suggests that organizational capabilities represented by supply chain integration and management commitment improve performance primarily through direct strategic and operational mechanisms rather than indirectly through sustainability practices. In the context of handicraft MSMEs, sustainability initiatives appear to complement, rather than transmit, the effects of organizational capabilities on firm performance.

Third, this study contributes to the emerging literature on supply chain resilience and sustainability by incorporating Supply Chain Challenges as a contextual factor. The findings demonstrate that external challenges influence the effectiveness of sustainability initiatives, highlighting the importance of considering environmental uncertainty when examining sustainable supply chain practices and organizational performance.

Finally, this study enriches the limited empirical evidence on sustainable supply chain management within handicraft MSMEs in developing countries. While previous studies have primarily focused on manufacturing firms and large-scale enterprises, this research confirms that sustainability-oriented supply chain capabilities are equally important for improving competitiveness and long-term performance among handicraft MSMEs.

Supply Chain Integration and MSME Performance

The significant positive effect of Supply Chain Integration on both Sustainable Supply Chain Practices and MSME Performance demonstrates that integration capabilities constitute strategic organizational resources that enhance competitiveness. This finding supports the Natural Resource-Based View (NRBV), which argues that valuable organizational capabilities can generate superior performance outcomes through efficient resource utilization and collaborative relationships.

For handicraft MSMEs, stronger integration with suppliers and customers facilitates information exchange, improves coordination, and reduces operational uncertainty. These mechanisms enable firms to respond more effectively to market demands while simultaneously supporting the implementation of sustainability-oriented activities. The findings are consistent with previous studies by Masudin et al. (2024) and Gunasekaran et al. (2022), which reported that supply chain integration improves organizational adaptability and operational performance.

Theoretically, this result extends the application of NRBV to creative-industry MSMEs operating in emerging economies. Unlike large organizations that rely on formal systems and digital infrastructure, handicraft MSMEs achieve performance improvements through relational integration and collaborative practices. Therefore, supply chain integration represents an important capability that contributes directly to performance enhancement in resource-constrained environments.

Management Commitment as a Strategic Capability

Management Commitment exhibits the strongest influence on Sustainable Supply Chain Practices and also has a significant positive effect on MSME performance. This finding highlights the critical role of leadership in shaping sustainability orientation and organizational outcomes. Consistent with Dynamic Capabilities Theory, managerial commitment enables firms to mobilize resources, support organizational change, and embed sustainability considerations into business operations. In MSMEs, where

decision-making is highly centralized, leadership commitment becomes a key driver of both sustainability initiatives and performance improvement.

Sustainable Supply Chain Practices and Performance

The results indicate that SSCP significantly improves MSME performance. This finding reinforces the NRBV argument that sustainability-oriented practices can serve as valuable organizational capabilities that contribute to long-term competitiveness and business success. Through responsible sourcing, resource efficiency, and environmentally conscious operations, MSMEs can enhance both operational effectiveness and market legitimacy.

However, although SSCP directly improves performance, it does not significantly mediate the relationships between SCI, MC, and MSME performance. This suggests that SCI and MC contribute to performance primarily through their direct effects rather than indirectly through sustainability practices.

The Moderating Role of Supply Chain Challenges

The significant moderating effect of Supply Chain Challenges indicates that sustainability-oriented practices become increasingly valuable under conditions of supply uncertainty and operational disruption. This finding highlights the importance of contextual factors in determining the effectiveness of sustainability initiatives within MSMEs. Under conditions of supply uncertainty, market volatility, or operational disruptions, sustainability-oriented practices become increasingly important for maintaining and improving performance. This finding emphasizes the contextual nature of sustainability benefits and highlights the importance of considering external challenges when evaluating SSCM effectiveness.

Directions for Future Research

Future studies may employ longitudinal designs to examine how sustainability practices influence performance over time. Further research could also investigate additional organizational and environmental factors that may explain MSME performance, including digitalization, innovation capability, and market orientation. Comparative studies across industries and regions would also provide a broader understanding of SSCM implementation in emerging economies.

Practical Implications

The findings suggest several practical implications. First, MSME owners should prioritize strengthening supply chain integration through closer collaboration with suppliers and customers, supported by digital communication and information-sharing mechanisms. Second, management commitment should be translated into concrete sustainability initiatives, including responsible sourcing, waste reduction, and environmentally friendly production practices. Third, local governments and MSME development agencies should provide sustainability training, digital supply chain support, and collaborative marketing platforms that enhance supply chain resilience. Finally, because Supply Chain Challenges strengthen the effectiveness of Sustainable Supply Chain Practices, MSMEs should integrate sustainability into their risk management strategies rather than treating it merely as a compliance activity.

Discussion of Non-Significant Relationships

The non-significant mediating effects of Sustainable Supply Chain Practices suggest that the performance improvements generated by Supply Chain Integration and Management Commitment occur primarily through direct organizational mechanisms rather than through sustainability initiatives. One possible explanation is that handicraft MSMEs

generally operate with relatively simple organizational structures and highly centralized decision-making processes. Consequently, improvements in coordination and managerial commitment may directly influence operational performance without necessarily being translated into formal sustainability practices.

Another possible explanation is that sustainability initiatives among handicraft MSMEs remain incremental rather than strategic. Many MSMEs implement environmentally responsible activities primarily to improve operational efficiency or comply with customer expectations, but these practices have not yet become sufficiently integrated into organizational routines to function as mediating mechanisms. Therefore, Sustainable Supply Chain Practices complement rather than transmit the effects of organizational capabilities on MSME performance.

CONCLUSION

This study examines the effects of Supply Chain Integration (SCI), Management Commitment (MC), Sustainable Supply Chain Practices (SSCP), and Supply Chain Challenges (SCC) on the performance of handicraft MSMEs in Bantul Regency. The findings demonstrate that Supply Chain Integration and Management Commitment significantly and positively influence both Sustainable Supply Chain Practices and MSME performance. In addition, Sustainable Supply Chain Practices significantly improve MSME performance, highlighting the importance of sustainability-oriented activities in enhancing business outcomes.

The study also finds that Sustainable Supply Chain Practices do not mediate the relationships between Supply Chain Integration, Management Commitment, and MSME performance. This indicates that the contributions of SCI and MC to performance occur primarily through their direct effects rather than indirectly through sustainability practices. Furthermore, Supply Chain Challenges significantly moderate the relationship between Sustainable Supply Chain Practices and MSME performance, suggesting that the effectiveness of sustainability-oriented practices depends on the level of challenges faced by MSMEs.

From a theoretical perspective, the findings support the Natural Resource-Based View (NRBV) by demonstrating that supply chain integration, managerial commitment, and sustainability-oriented practices constitute valuable organizational capabilities that contribute to superior performance. The study also extends Dynamic Capabilities Theory by highlighting the critical role of managerial commitment in enabling MSMEs to adopt sustainability practices and respond effectively to changing supply chain conditions. From a managerial perspective, MSME owners and managers should strengthen supply chain integration, demonstrate strong commitment to sustainability initiatives, and continuously improve sustainable supply chain practices to enhance organizational performance. Policymakers and development agencies are encouraged to support MSMEs through capacity-building programs, sustainability training, digitalization initiatives, and supply chain resilience development.

Overall, this study provides empirical evidence that sustainable supply chain management should be viewed not merely as an environmental initiative but as a strategic capability that strengthens the long-term competitiveness of handicraft MSMEs in emerging economies.

LIMITATION

Despite its contributions, this study has several limitations. First, the research was conducted exclusively among handicraft MSMEs located in Bantul Regency, Indonesia. Therefore, the findings may not be fully generalizable to MSMEs operating in different industries or geographical regions.

Second, the study employed a cross-sectional research design, which limits the ability to establish causal relationships over time. Future studies are encouraged to adopt longitudinal approaches to examine how sustainable supply chain practices evolve and influence organizational performance in the long term.

Third, data were collected using self-reported questionnaires from a single respondent representing each enterprise. Although statistical procedures were applied to minimize common method bias, future research may benefit from collecting data from multiple respondents or combining survey data with objective performance indicators.

Fourth, this study focused on Supply Chain Integration, Management Commitment, Sustainable Supply Chain Practices, and Supply Chain Challenges. Future research may consider incorporating additional variables such as digital transformation, organizational learning capability, green innovation, environmental turbulence, and supply chain resilience to improve the explanatory power of the proposed model.

Finally, future studies are encouraged to conduct comparative analyses across industries, regions, and countries to better understand the contextual factors influencing sustainable supply chain management and MSME performance.

ACKNOWLEDGMENT

The authors would like to express their sincere appreciation to all MSME owners and managers in Bantul Regency who generously participated in this study and provided valuable information during the data collection process. The authors also extend their gratitude to academic supervisors, colleagues, and reviewers for their constructive feedback and support throughout the completion of this research. Institutional support that facilitated the successful completion of this study is gratefully acknowledged.

DECLARATION OF CONFLICTING INTERESTS

The authors declare that there are no conflicts of interest regarding the research, authorship, and publication of this article

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