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Sustainable Organizational Culture and Competitive Advantage in MSMEs: The Mediating Role of Sustainable Supply Chain

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Abstract: Intensifying business competition and increasing stakeholder expectations for sustainable practices are driving firms to shift from temporary to sustainable competitive advantages. Despite this trend, few empirical studies have simultaneously investigated the roles of sustainable organizational culture and sustainable supply chains in achieving sustainable competitive advantage within a single integrated structural model. This study examines the relationship between Sustainable Organizational Culture (SOC) and Sustainable Supply Chain (SSC) and Sustainable Competitive Advantage (SCA), as well as the relationship between SSC and SCA. A quantitative research approach was adopted, utilizing a survey method. Data were collected via questionnaires from 158 MSME respondents in Karawang and Bekasi, Indonesia, and analyzed using Partial Least Squares-Structural Equation Modeling (PLS-SEM). The results of the study indicate that SOC has a positive and significant effect on both SSC and SCA, while SSC also has a positive and significant effect on SCA, with an R^2 value of 61.6% for SSC and 62.2% for SCA. The findings confirm that SSC partially mediates the relationship between SOC and SCA. Overall, the study demonstrates that sustainable organizational culture provides a strategic foundation that promotes the development of sustainable supply chains and directly enhances organizational competitive advantage, offering valuable guidance for managers and policymakers in developing long-term sustainability strategies.

Keywords: Sustainable Competitive Advantage; Sustainable Organizational Culture; Sustainable Supply Chain; Sustainability Value Chain Model

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INTRODUCTION

Environmentally friendly approaches and sustainable development have received increasing scholarly and industry attention in recent years (Zainurrafiqi et al., 2024). Global pressure for sustainable business practices has evolved from a normative discourse to a structural precondition for survival within global value chains. The European Union's carbon adjustment

mechanisms and supply chain due diligence obligations represent cross-border regulations that require all business actors, including upstream suppliers, to demonstrate the sustainability of their operations in a traceable and verifiable manner (Naunthong et al., 2026). As a result, sustainability has become a prerequisite for market access rather than merely an administrative compliance issue. Firms that consistently implement sustainable supply chain management have demonstrated greater efficiency, resilience, and reputational advantages compared to competitors that have not adapted (Sun et al., 2022). Consequently, industries increasingly integrate sustainability into their operations, particularly in supply chain management, to assess products from economic, social, and environmental perspectives (Muzayanah et al., 2024).

This pressure is particularly acute for Indonesian micro, small, and medium enterprises (MSMEs), which are economically vital yet strategically vulnerable. In 2024, the sector contributed approximately 59.64% of national GDP and accounted for 84.99% of the workforce (KUMKM, 2025). However, most MSMEs possess competitive advantages that are temporary and susceptible to shifts in the business environment, which undermines the long-term sustainability of their operations (Cantele & Zardini, 2018). The central challenge is to develop a sustainable competitive advantage (SCA), defined as an advantage based on resources that are valuable, rare, and difficult to imitate (Barney, 1991; Purwoko et al., 2023).

Two internal factors widely regarded as foundational to SCA are sustainable organizational culture (SOC) and sustainable supply chain (SSC) practices. SOC encompasses shared values and norms that direct organizational members toward economic, social, and environmental sustainability (Ketprapakorn & Kantabutra, 2022). Empirical evidence indicates that SOC positively influences SCA by promoting continuous innovation and adaptability (Osei et al., 2023; Shahzad et al., 2021). SSC involves the integration of economic, environmental, and social considerations into all supply chain activities, thereby enhancing product differentiation and customer loyalty (Birasnav et al., 2022; Carter, 2008). However, the implementation of SSC in smaller firms is often constrained by structural barriers, including limited resources and managerial capacity (Sarkis, 2021).

These challenges are particularly pronounced in Karawang Regency and Bekasi Regency. Both regions feature a combination of industrial zones, extensive trade networks, and proximity to the Jabodetabek growth hub, contributing to an increase in the number of micro and small enterprises (Figure 1). MSMEs in these areas are integrated into industrial supply chains, making them primary recipients of the aforementioned sustainability requirements. This environment also generates intense competition, resource constraints, pressure for operational efficiency, and the need for technological adaptation. Consequently, MSMEs in Karawang and Bekasi must achieve economic viability while simultaneously incorporating social and environmental considerations into their daily operations, highlighting the critical role of SOC and SSC.

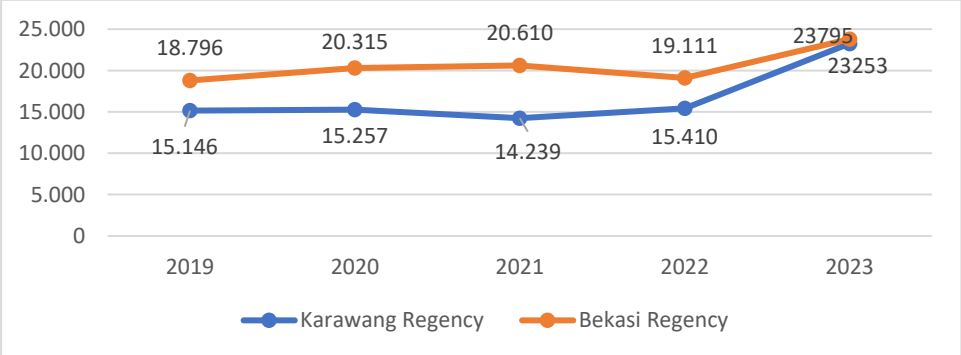


Figure 1. Count of Micro and Small Enterprises in the Karawang and Bekasi Regency (BPS, 2025)

Current research does not sufficiently explain how these capabilities interact within this context, due to three primary limitations. First, most evidence is derived from large, resource-rich organizations, such as manufacturers in India (Das, 2018), pharmaceutical firms in Pakistan (Sun et al., 2022) and technologically mature Chinese SMEs The limited evidence from Indonesian MSMEs focuses on environmental performance and operational costs rather than sustainable competitive advantage (Siregar, 2022). Second, key constructs are typically examined in isolation. For example, some studies relate sustainable organizational culture (SOC) to sustainable competitive advantage (SCA) and green innovation (Osei et al., 2023; Qu et al., 2021; M. A. Shahzad, 2023) , while others connect sustainable supply chain (SSC) or supply chain management (SCM) to SCA (Lee & Tang, 2017; Lim et al., 2017; Negri, 2021; Sarkis, 2021). Additional research investigates alternative determinants of SCA (Arsawan, 2020; Birasnav et al., 2022; Cantele & Zardini, 2018; Haseeb et al., 2019). Third, studies that attempt to integrate these elements often leave significant gaps. Some omit organizational culture (Das, 2018; Sun et al., 2022), while others conceptualize SOC without empirically testing its relationship to supply chain or competitive advantage (Assoratgoon & Kantabutra, 2023). Although green culture has been shown to influence logistics performance in developing-country manufacturing MSMEs, its impact on SCA remains unexamined (Junejo et al., 2025). Furthermore, cultural, supply chain, and competitive dimensions are frequently analyzed separately, neglecting their potential synergy (Primadasa et al., 2025).

This study addresses these gaps by empirically testing the relationships among SOC, SSC, and SCA within a single structural model for MSMEs in Karawang and Bekasi. Drawing on the Resource-Based View, SOC is conceptualized as a fundamental intangible resource: an organization's core principles form the foundation for embedding sustainability into core business activities (Alemu, 2025), while shared sustainability values influence the mindsets and behaviors that guide operational decisions (Assoratgoon & Kantabutra, 2023). SOC is operationalized through SSC practices, including ethical sourcing, green production, and responsible waste management (Naunthong et al., 2026). SSC functions as a relational capability that transforms internal cultural values into differentiation in cost, quality, and reputation, thereby supporting SCA (Cahyono et al., 2023; Maisaroh, 2021). By integrating these elements within a unified framework, this study offers new empirical evidence on the mechanisms through which internal organizational values are translated into sustainable operational practices, ultimately enhancing MSME competitive advantage.

METHOD

A quantitative cross-sectional survey design was utilised to test objective theories by examining associations between variables. The study population comprised micro, small, and medium enterprises (MSMEs) in Karawang and Bekasi Regencies, totalling 707,343 MSMEs: 355,623 in Karawang and 351,720 in Bekasi (Bappenas, 2024). The sample size was determined according to the requirements of Structural Equation Modelling based on Partial Least Squares (SEM-PLS). Sample size determination in PLS-SEM should account for model complexity, the number of indicators, and the statistical power necessary to detect relationships among constructs (Hair et al., 2020). As a preliminary guideline, 5–10 observations per indicator are commonly recommended. With 16 indicators used in this study, nine observations per indicator yielded a minimum sample size of 144 respondents (16 × 9). A total of 158 valid responses were collected, surpassing the minimum requirement and ensuring an adequate sample for PLS-SEM analysis.

The final sample included 83 MSMEs from Bekasi Regency and 75 MSMEs from Karawang Regency. Proportional distribution by regency population was not required, as purposive sampling was employed instead of proportionate probability sampling. All selected respondents met the predetermined inclusion criteria and possessed relevant knowledge and experience regarding the business practices under investigation. Therefore, the sample of 158 respondents was deemed suitable for analyzing the relationships among sustainable organizational culture, sustainable supply chain, and sustainable competitive advantage.

Data analysis was conducted using SEM-PLS, which is suitable for evaluating research models with multiple latent constructs, complex structural relationships, and mediating or moderating variables. Model assessment included evaluation of the measurement and structural models, considering reliability, construct validity, path coefficients, R^2 values, effect sizes, and the significance of inter-variable relationships (Hair et al., 2020). The research framework is presented in Figure 2.

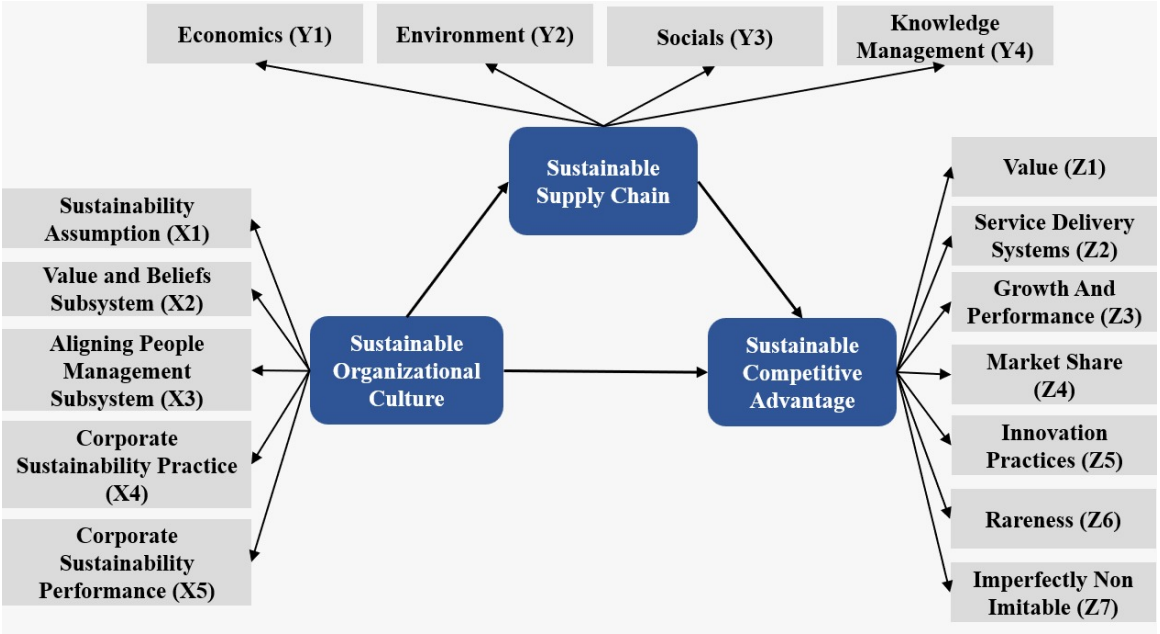


Figure 2. An Integrative Model of Sustainable Organizational Culture and Sustainable Supply Chain for Enhancing the Sustainable Competitive Advantage of MSMEs (Arsawan, 2020; Ketprapakorn & Kantabutra, 2022; Lim et al., 2017)

A first-order reflective measurement model was employed, incorporating three latent constructs: Sustainable Organizational Culture (SOC), Sustainable Supply Chain (SSC), and Sustainable Competitive Advantage (SCA). SOC was measured using four dimensions: sustainability assumptions, value and beliefs subsystem, emotionally committed members, and sustainability practices and processes. SSC was evaluated through four dimensions: economic, environmental, social, and knowledge management. SCA was defined by seven dimensions: value, service delivery systems, growth and performance, market share, innovation practices, rareness, and imperfect imitability. Each dimension was specified as a reflective indicator of its respective latent construct. Accordingly, the measurement model posits that changes in the latent construct are reflected in its observed indicators. This reflective specification aligns with the hypothesized directionality in the proposed model, wherein latent constructs predict their measurement dimensions.

The hypotheses tested in this study are as follows:

H1 : Sustainable Organizational Culture (SOC) has a positive and significant effect on Sustainable Supply Chain (SSC)
H2 : Sustainable Organizational Culture (SOC) has a positive and significant effect on Sustainable Competitive Advantage (SCA)
H3 : Sustainable Supply Chain (SSC) has a positive and significant effect on Sustainable Competitive Advantage (SCA)
H4 : Sustainable Supply Chain (SSC) mediates the effect of Sustainable Organizational Culture (SOC) on Sustainable Competitive Advantage (SCA)

RESULTS AND DISCUSSION

Research Results

This study used the Partial Least Square Structural Equation Modelling (SEM-PLS) approach to examine the interactions among Sustainable Organizational Culture (SOC), Sustainable Supply Chain (SSC), and Sustainable Competitive Advantage (SCA). The analysis assessed the interrelationships between these constructs and confirmed that the selected indicators accurately represented each concept. The evaluation followed two main stages. First, a measurement model test verified the validity and reliability of the constructs. Second, a structural model test determined the direction, strength, and relevance of the relationships within the research model.

1. Measurement Model Testing

The evaluation of the measurement model involves executing multiple assessments, including Indicator reliability, Internal consistency reliability, Convergent validity, Discriminant validity (Hair et al., 2020). The results of the measurement model testing in this study are as follows:

a. Indicator reliability

Indicator reliability reflects the extent to which an indicator accurately represents the underlying construct it assesses. The reliability of indicators is assessed by analysing the outer loading values for each indicator within every construct, according to the criteria presented in Table 1.

Table 1. Outer Loading Criteria

Outer Loading	Interpretation
≥ 0,708	Good, indicator retained
0,40 – 0,70	Additional assessment
< 0,4	Indicator eliminated

The results of the outer loading of the indicators of each construct of the study model utilized are presented in Table 2.

Table 2. Outer Loading

Indicator <- Construct	Outer loadings
X1 <- Sustainable Organizational Culture (SOC)	0,603
X2 <- Sustainable Organizational Culture (SOC)	0,861
X3 <- Sustainable Organizational Culture (SOC)	0,841
X4 <- Sustainable Organizational Culture (SOC)	0,857
X5 <- Sustainable Organizational Culture (SOC)	0,849
Y1 <- Sustainable Supply Chain (SSC)	0,863
Y2 <- Sustainable Supply Chain (SSC)	0,760

Indicator <- Construct	Outer loadings
Y3 <- Sustainable Supply Chain (SSC)	0,874
Y4 <- Sustainable Supply Chain (SSC)	0,817
Z1 <- Sustainable Competitive Advantage (SCA)	0,825
Z2 <- Sustainable Competitive Advantage (SCA)	0,756
Z3 <- Sustainable Competitive Advantage (SCA)	0,807
Z4 <- Sustainable Competitive Advantage (SCA)	0,722
Z5 <- Sustainable Competitive Advantage (SCA)	0,777
Z6 <- Sustainable Competitive Advantage (SCA)	0,678
Z7 <- Sustainable Competitive Advantage (SCA)	0,476

As indicated on Table 2, there is one indicator for the Sustainable Organizational Culture (SOC) variable, the Sustainable Assumption (X1), with outer loadings of 0.4 to 0.7. In addition, for the Sustainable Competitive Advantage (SCA) variable, two indicators, Rareness (Z6) and Imperfectly Non-Imitable (Z7), have outer loadings of 0.4 to 0.6. Therefore, three indicators fall within the 0.4–0.7 interval, which requires further investigation to determine if the indicators should be preserved or not. In contrast, the other parameters such as Value and Beliefs Subsystem (X2), Aligning people management subsystem (X3), Corporate sustainability practice (X4), Corporate sustainability performance (X5), Economics (Y1), Environment (Y2), Socials (Y3), Knowledge Management (Y4), Value (Z1), Service Delivery System (Z2), Growth and Performance (Z3), Market Share (Z4), Innovation Practices (Z5) demonstrate outer loadings greater than 0.7. Consequently, each of these indications can be deemed reliable and fitting for retention inside the research model.

b. Internal Consistency Reliability

Internal consistency reliability indicates the extent to which the indicators that make up a construct are consistent in measuring that construct. In the SEM-PLS model, several measures are used to assess internal consistency reliability, including Cronbach's Alpha (α), Composite Reliability (ρc), and rho_A (ρA). If a construct has Cronbach's Alpha (α) and Composite Reliability (ρc) values between 0.7 and 0.9, it can be said that the construct has good reliability. Similarly, for rho_A (ρA), if a construct has a rho_A (ρA) value greater than 0.7, it can be said that the construct has good reliability. Based on the data analysis conducted, the Cronbach's Alpha (α), Composite Reliability (ρc), and rho_A (ρA) values for the constructs in this study are presented in Table 3.

Table 3. Internal Consistency Reliability Testing

Constructs	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Conclusion
Sustainable Competitive Advantage (SCA)	0,851	0,875	0,886	Reliable
Sustainable Organizational Culture (SOC)	0,864	0,885	0,903	Reliable
Sustainable Supply Chain (SSC)	0,849	0,862	0,898	Reliable

According to Table 3, it can be seen that the Sustainable Competitive Advantage (SCA) construct, the Sustainable Organizational Culture (SOC) construct, and the Sustainable Supply Chain (SSC) construct all meet the criteria for Cronbach's Alpha (α), Composite Reliability (ρc),

and rho_A (ρA) criteria; thus, it can be concluded that all three constructs are dependable, indicating that they consistently measure their respective construct.

c. Convergent Validity

Convergent validity assessment evaluates the degree to which indicators of a construct effectively measure the same construct, indicating a relationship among the indicators and a significant level of similarity. Convergent validity assessment is performed via the Average Variance Extracted (AVE) metric. If a construct possesses an AVE value of ≥ 0.5, it can be inferred that convergent validity is achieved. n the relationship model between the constructs of Sustainable Competitive Advantage (SCA), Sustainable Organizational Culture (SOC), and Sustainable Supply Chain (SSC), the results of the convergent validity test are presented in Table 4.

Table 4. Convergent Validity Testing

Constructs	Average variance extracted (AVE)	Criteria	Conclusion
Sustainable Competitive Advantage (SCA)	0,531	≥ 0,5	Fulfilling
Sustainable Organizational Culture (SOC)	0,653	≥ 0,5	Fulfilling
Sustainable Supply Chain (SSC)	0,688	≥ 0,5	Fulfilling

According to Table 4, it can be deduced that the three constructs employed in the research framework—Sustainable Competitive Advantage (SCA), Sustainable Organizational Culture (SOC), and Sustainable Supply Chain (SSC)—satisfy the requirements for convergent validity assessment; therefore, it can be inferred that the indicators associated with these constructs effectively measure the same construct.

d. Discriminant Validity

Discriminant validity aims to ensure that each construct in the model is empirically distinct from the other constructs. The recommended measure for testing discriminant validity is the HTMT. The criterion used is that if a construct has an HTMT value < 0.9, then discriminant validity is considered to have been met. Table 5 shows the results of the discriminant validity test for all constructs in the research model.

Table 5. Discriminant Validity Testing

Constructs	Heterotrait-monotrait ratio (HTMT)	Criteria	Conclusion
SOC <-> SCA	0,818	0,9	Fulfilling
SSC <-> SCA	0,835	0,9	Fulfilling
SSC <-> SOC	0,896	0,9	Fulfilling

Discriminant validity aims to ensure that each construct in the model is empirically distinct from the other constructs. The recommended measure for testing discriminant validity is the HTMT. The criterion used is that if a construct has an HTMT value < 0.9, then discriminant validity is considered to have been met. Table 5 shows the results of the discriminant validity test for all constructs in the research model.

2. Structural Model Testing

Structural model evaluation aims to examine the integrity of the associations between the constructs established in the research framework and to ascertain the model's capacity to elucidate and forecast endogenous components. The assessment of the structural model occurs in phases by analysing multicollinearity across predictor constructs, evaluating the significance

and relevance of path coefficients, measuring explanatory power via the R^2 value, and determining the model's predictive capability.

a. Structural Model Collinearity Test

Collinearity in a structural model is evaluated using the Variance Inflation Factor (VIF). Hair et al. (2020) states that the VIF threshold for assessing collinearity in a structural model indicates that a VIF score below 3 signifies the absence of collinearity problems. If the VIF value ranges from 3 to 5, the model exhibits acceptable multicollinearity, while it requires monitoring. On the other hand, a VIF value over 5 indicates that the model suffers from multicollinearity issues. The outcomes of the multicollinearity assessment for the research model are displayed in Table 6.

Table 6. Results of the Collinearity Test for the Structural Model

Constructs	VIF	Criteria	Conclusion
SOC -> SCA	2,602	3	No collinearity
SOC -> SSC	1,000	3	No collinearity
SSC -> SCA	2,602	3	No collinearity

The findings shown in Table 6 indicate that the VIF values for every predictor construct remain below 3.0, a threshold deemed more cautious. Consequently, there is no evidence of multicollinearity that would disrupt the assessment of structural relationships within the research framework.

b. Significance and Relevance Tests for Structural Relationships

Significance and relevance tests for structural relationships are used to examine the influence of predictor variables on the response variable. The importance of path coefficients in a structural model can be evaluated by the t-statistic or the p-value. The parameters for this examination are: if the t-statistic exceeds 1.96 or the p-value falls below α (0.05), then the predictor variable affects the response variable at the 5% significance level (α). The results of the path coefficient tests in the structural model are presented in Table 7.

Table 7. Results of the Significance Test for Path Coefficients

Construct	Coefficient	t-statistics	P values	Conclusion
SOC -> SCA	0,425	5,991	0,000	Positive and Significant
SOC -> SSC	0,785	13,281	0,000	Positive and Significant
SSC -> SCA	0,410	5,580	0,000	Positive and Significant

The results of the structural model testing, conducted using the bootstrapping procedure, demonstrate that all relationships among the tested constructs are positive and statistically significant. The relationship between Sustainable Organizational Culture (SOC) and Sustainable Competitive Advantage (SCA) yielded a path coefficient of 0.425, with a t-statistic of 5.991 and a p-value of 0.000. Additionally, the relationship between SOC and Sustainable Supply Chain (SSC) produced a path coefficient of 0.785, a t-statistic of 13.281, and a p-value of 0.000. The relationship between SSC and SCA resulted in a path coefficient of 0.410, a t-statistic of 5.580, and a p-value of 0.000. All t-statistics exceeded 1.960, and all p-values were below 0.05, indicating that all three structural associations are statistically significant. These results suggest that Sustainable Organizational Culture positively influences Sustainable Competitive Advantage, both directly and indirectly, by strengthening the Sustainable Supply Chain. Consequently, further analysis was conducted to examine whether the Sustainable Supply Chain serves as a mediating variable in the

relationship between Sustainable Organizational Culture and Sustainable Competitive Advantage. The results of the path coefficient tests for the mediating variable are presented in Table 8.

Table 8. Results of the Significance Test for Path Coefficients

Construct	Original sample	t-statistics	P values	Conclusion
SOC-> SSC -> SCA	0,322	5,248	0,000	Significant

The results indicate that the indirect effect of Sustainable Organizational Culture (SOC) on Sustainable Competitive Advantage (SCA) via the Sustainable Supply Chain (SSC) yields a coefficient of 0.322, a t-statistic of 5.248, and a p-value of 0.000. Since the t-statistic exceeds 1.960 and the p-value is below 0.05, this indirect effect is both positive and statistically significant. Therefore, the Sustainable Supply Chain serves as a mediating variable in the relationship between Sustainable Organizational Culture and Sustainable Competitive Advantage. The comprehensive model applied in this study is presented in Figure 3.

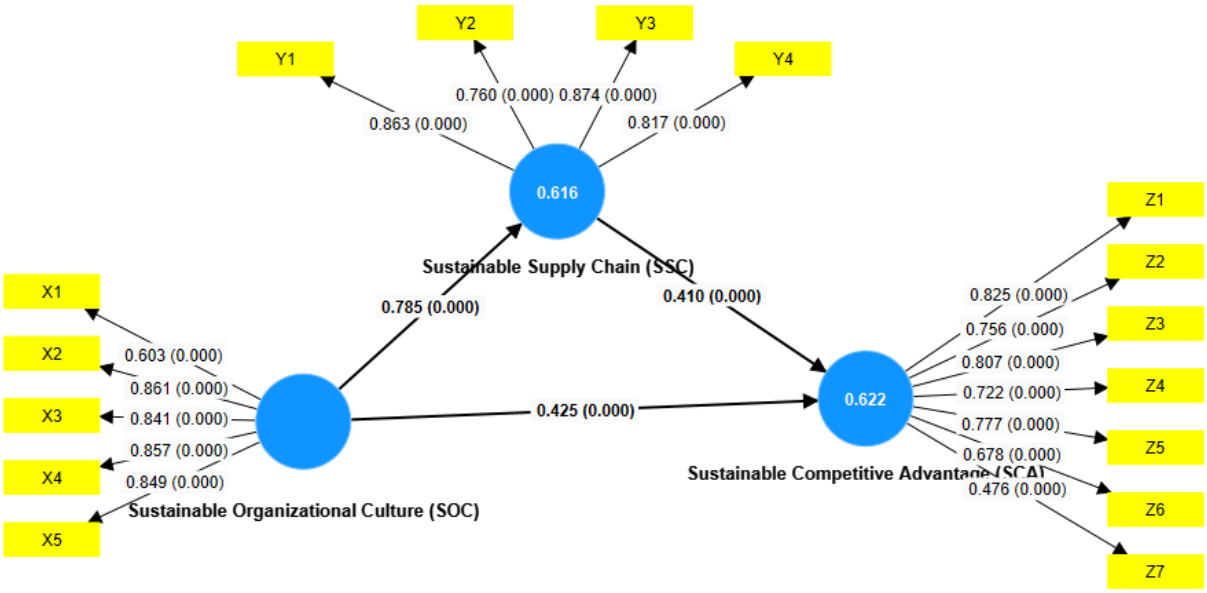


Figure 3. A Model of the Relationship Between Sustainable Organizational Culture (SOC), Sustainable Supply Chain (SSC), and Sustainable Competitive Advantage (SCA).

c. Explanatory Power Test

Following confirmation of the significance of the relationships among the constructs in the model, the subsequent analysis focused on evaluating the extent to which the model explains the examined phenomenon. The significance of these relationships alone does not fully capture the model's explanatory power. Consequently, the evaluation proceeds by examining the R^2 value to assess the model's strength with respect to the endogenous construct, and the f^2 value to determine the relative contribution of each predictor construct in explaining its respective outcome. Table 9 presents the R^2 values for the resulting structural model.

Table 9. R^2 Value

Construct	R-square	R-square adjusted	Conclusion
Sustainable Competitive Advantage (SCA)	0,622	0,618	A Fairly Robust Model
Sustainable Supply Chain (SSC)	0,616	0,613	A Fairly Robust Model

The test results show that the R^2 value for Sustainable Competitive Advantage (SCA) is 0.622. This value indicates that Sustainable Organizational Culture (SOC) and Sustainable Supply Chain (SSC) together account for 62.2% of the variation in Sustainable Competitive Advantage (SCA), while the remaining 37.8% is influenced by other factors not included in the research model. Meanwhile, the R^2 value for Sustainable Supply Chain (SSC) is 0.616, indicating that Sustainable Organizational Culture (SOC) accounts for 61.6% of the variation in Sustainable Supply Chain (SSC), while the remaining 38.4% is explained by factors outside the model.

The R-squared test results provide an indication of the extent to which the endogenous construct can be explained by the predictor variables in the model as a whole. However, the R-squared value does not indicate the extent of each predictor construct's contribution to explaining changes in the endogenous construct. Therefore, the analysis continued with an effect size (F-squared) test to examine the magnitude of each structural relationship's contribution within the model. This test helps provide a more in-depth understanding of which constructs play a greater role in explaining the endogenous construct. The results of the effect size (f^2) test are presented in Table 10.

Table 10. Effect Size Testing (f^2)

Construct	f-square	Conclusion
SOC -> SCA	0,184	Moderate Effect
SOC -> SSC	1,602	Major Effect
SSC -> SCA	0,171	Moderate Effect

The test results show that the effect of Sustainable Organizational Culture (SOC) on Sustainable Competitive Advantage (SCA) has an f^2 value of 0.184, which falls into the moderate effect category. Furthermore, the effect of SOC on the Sustainable Supply Chain (SSC) yields an f^2 value of 1.602, indicating major effect. Meanwhile, the effect of the Sustainable Supply Chain (SSC) on the Sustainable Competitive Advantage (SCA) has an f^2 value of 0.171 and falls into the moderate effect category. These results indicate that Sustainable Organizational Culture makes the greatest contribution to explaining the Sustainable Supply Chain. Meanwhile, the contributions of Sustainable Organizational Culture (SOC) and the Sustainable Supply Chain (SSC) in explaining Sustainable Competitive Advantage (SCA) fall into the moderate category and are relatively balanced.

d. Evaluation of the model's predictive power

The next step in evaluating a structural model is to assess the model's predictive power. This evaluation is conducted to determine the extent to which the PLS-SEM model is capable of making predictions about observations not used in the model estimation process. The predictive power test was conducted using the PLS_predict procedure via a k-fold cross-validation approach. The results of the model's predictive power test are presented in Table 11.

Table 11. Predictive Power Model Test Results

Construct	Q^2_predict	RMSE	MAE	Conclusion
Sustainable Competitive Advantage (SCA)	0,561	0,684	0,553	Positive predictive power
Sustainable Supply Chain (SSC)	0,627	0,643	0,479	Positive predictive power

The test results show that the Q^2_predict value for Sustainable Competitive Advantage (SCA) is 0.561, while Sustainable Supply Chain (SSC) has a Q^2_predict value of 0.627. Both values are above zero, indicating that the model has predictive power for both endogenous constructs. The higher Q^2_predict value for SSC indicates that the model has relatively better predictive power

for Sustainable Supply Chain than for Sustainable Competitive Advantage. Furthermore, the prediction error evaluation shows an RMSE of 0.684 and an MAE of 0.553 for Sustainable Competitive Advantage (SCA), while for Sustainable Supply Chain (SSC), the RMSE is 0.643 and the MAE is 0.479. The comparative analysis at the indicator level reveals that the majority of indicators exhibit reduced PLS-SEM prediction error values in contrast to the LM, suggesting that the model possesses commendable predictive capability. In general, the model demonstrates strong predictive capacity for the dimensions of Sustainable Supply Chain and Sustainable Competitive Advantage, as indicated by favourable Q^2_predict values for both dimensions and a majority of indicators producing reduced PLS-SEM prediction errors relative to the Linear Model standard.

Discussion

The analysis of the measurement model reveals that it fulfils the standards for internal consistency reliability, convergent validity, and discriminant validity; thus, the Sustainable Assumption indicator (X1), the Rarity indicator (Z6), and the Imperfectly Non-Imitable indicator (Z7) do not require elimination from the construct, even with outer loadings under 0.708. Therefore, it can be determined that the measurement model adheres to the criteria for validity and reliability; the following step is to analyse the structural model. An examination of the structural model is performed to identify the interrelations among Sustainable Organizational Culture (SOC), Sustainable Supply Chain (SSC), and Sustainable Competitive Advantage (SCA).

Structural equation modeling (PLS-SEM) results demonstrate that SOC has a positive and statistically significant effect on SSC, with a path coefficient of 0.785 ($p = 0.000$). SOC also exerts a direct, positive, and substantial influence on SCA (0.425, $p = 0.000$), while SSC impacts SCA (0.410, $p = 0.000$). All three paths were significant at the 5% significance level ($p = 0.000 < 0.05$), thus supporting the acceptance of all hypotheses.

The coefficient of determination (R^2) indicates that the model explains 61.6% of the variance in SSC and 62.2% in SCA (Table 9), reflecting moderate to substantial explanatory power. At the indicator level, all outer loadings exceeded the 0.70 threshold except for X1 (0.603) and Z7 (0.476), which are retained due to their sufficient contribution to convergent validity. All indicators were significant at $p = 0.000$. These results confirm that the reflective indicators for SOC, SSC, and SCA accurately represent their respective latent constructs. The findings demonstrate that a sustainability-oriented organizational culture underpins the development of sustainable supply chain practices and both directly and indirectly, through SSC as a partial mediator, fosters sustainable competitive advantage.

Developmental, group-centric, and hierarchical organizational cultures enhance supply chain integration within the food manufacturing sector in the United Kingdom and Greece, facilitating the exchange of knowledge, skills, information, and resources among organizational members to bolster sustainability performance. This aligns with the study's results indicating that SOC is a significant predictor of SSC ($\beta = 0.785$). Furthermore, this study extends institutional theory and the relational view by examining the influence of organizational culture on sustainable supply chain performance, while also highlighting the importance of external integration within these relationships to address various sustainability challenges and enhance sustainable supply chain performance in global supply chains. These findings reinforce the argument that culture is not merely an internal organizational value but a strategic asset transmitted throughout the supply chain network.

The findings of this study are consistent with those of Osei et al. (2023), who reported that sustainable supply chain strategies are positively and significantly associated with both sustainable supply chain practices and sustainable competitive advantage. Sustainable supply chain practices also positively relate to sustainable competitive advantage. Similarly, Mukhsin & Suryanto (2022) found that sustainable supply chain management influences competitive advantage and firm performance, both directly and through the mediating effect of competitive advantage. These results reinforce the relevance of the present model, particularly for businesses operating in Indonesia.

The direct SOC to SCA relationship observed in this study is consistent with the Resource-Based View, which posits that organizations with strategic resources—those that are valuable, rare, difficult to imitate, and organized to capture value—achieve significant competitive advantage. Organizational culture is identified as such a strategic resource. Empirical evidence from Truong et al. (2025) supports this, showing that organizational culture directly impacts organizational performance and indirectly affects it through competitive advantage. Obeng et al. (2026) indicates that organizational culture plays a crucial role in shaping competitive advantage, with entrepreneurial (Obeng et al., 2026; Truong et al., 2025) or SSC–SCA (Sun et al., 2022) separately, this research enhances the model, referred to as the Sustainability Value Chain Model. In this model, sustainable culture serves as the principal precursor, the sustainable supply chain acts as the intermediary mechanism, and sustainable competitive advantage emerges as the final strategic result.

Accordingly, the results of this research are consistent with existing literature in strategic management and sustainable supply chain management, particularly at the intersection of the Resource-Based View, Relational View Theory, and the Triple Bottom Line. These findings clarify how organizational cultural capital is transformed into competitive advantage through supply chain processes. First, organizations should view sustainable organizational culture (for example, by internalizing sustainability values into the vision, training, reward systems, and leadership) as a long-term investment, since the significant influence of SOC on SSC (0.785) indicates that cultural transformation is the most significant leverage point in this system. Second, given that SOC directly influences SCA, MSMEs do not need to wait until the entire supply chain system is fully developed to begin realizing the competitive advantages of cultural transformation; sustainable cultural initiatives can serve as a market differentiator from the outset. Third, considering that SSC is a significant avenue (0.410) leading to SCA, SMEs can enhance their green supply chain initiatives, including the adoption of environmentally friendly packaging, partnerships with suppliers, and optimization of logistics. This is consistent with evidence that entities employing sustainable supply chain practices achieve enhanced cost efficiency, reduced risk, improved brand reputation, and increased customer satisfaction.

CONCLUSION

This research concludes that SOC is important in building a Sustainable Supply Chain (SSC) and Sustainable Competitive Advantage (SCA) for MSMEs. A corporate culture that integrates sustainability aspirations, obligations, issues, and practices can motivate companies to apply sustainability concepts more broadly in supply chain management. Furthermore, the implementation of SSC serves as a tool to shift the focus from internal sustainability to operational efforts that generate value for the company, while simultaneously enhancing the capacity of MSMEs to build and maintain competitive advantage. This research illustrates that a sustainability-oriented culture enhances competitive advantage both directly and by bolstering

sustainable supply chain activities. These findings reinforce the understanding that sustainability in MSMEs is not merely an operational activity or a response to external demands, but rather needs to be developed as a strategic capability that originates from organizational culture and is realized through supply chain management. Theoretically, this study proposes a Sustainability Value Chain Model that integrates Sustainable Organizational Culture, Sustainable Supply Chain, and Sustainable Competitive Advantage into a single framework explaining the process of transforming internal resources into strategic capabilities and outcomes. The limitations of this study include the use of a cross-sectional design, which restricts the observation of the dynamics of relationships among constructs and the certainty of causal direction; the presence of several indicators with relatively low outer loadings, indicating the need for instrument refinement; and limitations in sample scope, industry sector, and business cultural context that must be considered when generalizing the study's findings.

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