Sustainability Practices and SME Performance: Advancing Halal Supply Chain Development in Malaysia

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ABSTRACT

As the halal economy continues to expand, firms are increasingly expected to look beyond halal certification and consider the entire supply chain, including how products are sourced, produced, transported, and delivered. For small and medium enterprises (SMEs), meeting these expectations requires balancing halal-related responsibilities with economic, environmental, and social considerations. Guided by the Triple Bottom Line (TBL), this study examines how social, economic and environmentally sustainable supply chain management (SSCM) practices influence the non-financial performance improvement of SMEs in Kuala Lumpur, and discusses the findings in relation to the development of a more sustainable halal supply chain. A quantitative, cross-sectional survey was administered to 234 SMEs selected through probability sampling from an estimated population of 625 firms. The data were analysed using descriptive statistics, reliability analysis, Pearson correlation and multiple regression in SPSS. The model explained 96.9% of the variance in performance improvement ($F = 2404.69$, $p < 0.001$). Economic sustainability emerged as the strongest predictor ($\beta = 0.531$, $p < 0.001$), followed by environmental sustainability ($\beta = 0.404$, $p < 0.001$), whereas social sustainability showed a positive but statistically insignificant effect ($\beta = 0.059$, $p = 0.201$). SMEs therefore obtain more immediate performance benefits from economically and environmentally oriented practices. From a halal supply chain perspective, sustainable halal implementation should not be reduced to certification or religious compliance alone: economic continuity, environmental responsibility, ethical sourcing, employee welfare and stakeholder trust must be integrated if *halalan toyyiban* is to function as a broader supply chain management philosophy. Future studies should test this framework among halal-certified SMEs using halal integrity, traceability and certification variables.

Keywords— Halal supply chain; sustainable supply chain management; triple bottom line; halalan toyyiban; SMEs; performance improvement

INTRODUCTION

Supply chains are increasingly expected to be closed-looped, environmentally friendly and conservative in their use of resources, and many scholars have argued that the future of supply chain management lies in sustainability [1], [2]. Sustainable supply chain management (SSCM) integrates environmental, social and economic considerations into supply chain operations [3], [4], an orientation rooted in the Triple Bottom Line (TBL) of people, planet and profit [5]. Recent disruptions have further shown that sustainability and resilience are closely intertwined in supply chain decision-making [6].

The same shift is visible in the halal economy. Halal is no longer understood only as a property of the final product; it now extends across sourcing, production, storage, transportation and handling, so that the integrity of a product must be safeguarded at every node of the supply chain [7], [8]. Halal integrity is therefore a supply chain outcome rather than a certificate alone [9], [10]. The concept of *halalan toyyiban* reinforces this view: beyond permissibility (*halal*), it requires that products and processes be good, wholesome, safe and

responsible (*toyyib*). This broader reading places halal supply chains close to the sustainability agenda, and a growing body of work has begun to examine the relationship between halal supply chain management and sustainability [11], [12].

Small and medium enterprises (SMEs) are central to both agendas. They form the majority of firms in Malaysia and in the halal sector, yet compared with large companies they tend to be less engaged in sustainability management, and empirical research on SSCM adoption among Malaysian firms remains limited [13], [14]. Evidence on whether sustainability pays off for small firms is also mixed: some small firms show little interest in green practices because they perceive no direct effect on performance [15], whereas owners and managers in other settings believe that environmental practices improve innovation, ecological and social performance [16].

Two gaps follow. First, evidence on how the three TBL dimensions contribute *differently* to SME performance remains scarce, which makes it difficult for resource-constrained SMEs to prioritise. Second, halal supply chain research has focused mainly on integrity, certification and critical success factors [17], while its link to sustainability is still emerging [11], [12]; there is little SME-level performance evidence that can inform how halal supply chains might be developed as sustainable systems.

This study addresses these gaps by (i) examining the effects of social, economic and environmental SSCM practices on the non-financial performance improvement of SMEs in Kuala Lumpur, (ii) identifying the most influential sustainability dimension, and (iii) interpreting the findings in terms of their implications for sustainable halal supply chain development in Malaysia. The remainder of the paper reviews the literature and develops the hypotheses, describes the methodology, presents the results, and discusses their implications for halal supply chains before concluding.

LITERATURE REVIEW AND HYPOTHESES

A. Sustainable Supply Chain Management and the Triple Bottom Line

SSCM refers to the integration of environmental, social and economic considerations into an organisation's supply chain operations [3], and the field has consistently adopted the TBL as its organising lens [4], [6]. The TBL places equal emphasis on economic, environmental and social performance, bringing balance and coherence to the sustainability construct and providing a framework for measuring business success along all three lines [5], [18], [19]. Its central proposition is that, at the intersection of the three dimensions, firms can undertake activities that benefit the natural environment and society while also producing long-term economic benefits and competitive advantage.

In practice, SSCM entails incorporating eco-friendly practices into supply chain processes to minimise waste, reduce energy consumption and pollution, and improve resource use from product design to end of life [20], [21]. The social dimension addresses human rights, fair labour, gender diversity and the effect of the firm on employees, value chain workers, customers and communities [22], [23], [24]. The economic dimension concerns the practices that sustain long-term financial viability—cost efficiency, reduced waste, prudent resource management and the financial health of supply chain partners. Prior studies have linked SSCM to corporate financial performance [25] and shown that green logistics practices improve financial performance through market, environmental and social performance [26].

B. Measuring Supply Chain Performance

Supply chain performance can be evaluated at strategic, tactical and operational levels [27], using financial and non-financial measures [28]. Financial measures alone do not fully capture the effects of sustainability practices, whereas non-financial measures such as customer satisfaction, quality and delivery performance carry indirect financial implications through customer retention, sales and margins [29]. Because the environmental and social benefits of SSCM are poorly reflected in short-term financial results, this study measures performance improvement through non-financial indicators: internal efficiency, quality and time; customer outcomes; innovation and growth; and employee engagement.

C. Halal Supply Chain and Halalan Toyyiban as a Sustainability Philosophy

Halal supply chain management extends halal requirements from the product to the network that produces and delivers it. Its core principles include avoiding direct contact with *haram* materials, managing the risk of contamination and addressing the perception of Muslim consumers [8]. Halal integrity must be maintained across raw material sourcing, processing, storage, transport and retail [9], and depends on a set of critical success factors that combine technical, managerial and institutional elements [17]. Ali and Suleiman [10] further show that halal food integrity is multidimensional, spanning raw material, process, storage, transportation and other integrity forms.

The *toyyib* element gives halal supply chains a natural affinity with the TBL. Cleanliness, safety and avoidance of harm correspond to environmental responsibility; fairness, honesty, ethical sourcing and the welfare of workers and communities correspond to social responsibility; and continuity, affordability and efficient use of resources correspond to economic responsibility. Khan *et al.* [11] examined the link between halal supply chain management and sustainability, and Rejeb *et al.* [12] reviewed sustainability in halal food supply chains, both indicating that this integration is still developing. Understanding which TBL dimensions deliver performance benefits to SMEs is therefore a useful starting point for building sustainable halal supply chains.

D. Research Framework and Hypotheses

Grounded in the TBL, the research framework (Fig. 1) positions social, economic and environmental sustainability practices as independent variables and non-financial performance improvement as the dependent variable.

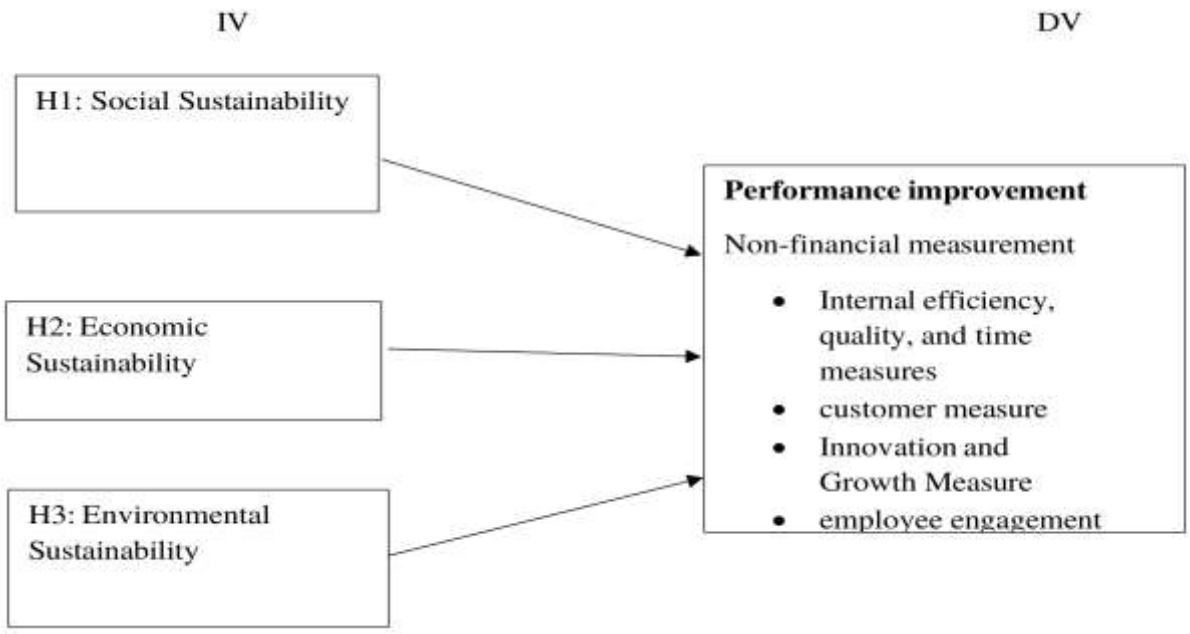


Fig. 1 Research framework based on the Triple Bottom Line (Elkington)

Social practices may enhance reputation, stakeholder trust and customer preference [30], although they can also create tensions with short-term business goals [31]. Economic sustainability practices streamline operations, reduce waste and open new value-creation opportunities [32], [25]. Environmental practices can lower costs through resource efficiency and strengthen competitiveness [33], [21], and have been associated with improved SME performance [16]. Accordingly:

H1: Social sustainability has a significant effect on the performance improvement of SMEs in Kuala Lumpur.

H2: Economic sustainability has a significant effect on the performance improvement of SMEs in Kuala Lumpur.

H3: Environmental sustainability has a significant effect on the performance improvement of SMEs in Kuala Lumpur.

METHODOLOGY

A. Research Design and Sampling

The study adopted an explanatory, quantitative, cross-sectional design using a survey strategy [34]. The target population comprised SMEs operating in Kuala Lumpur, the national capital and a major economic hub with a dense concentration of SMEs. The population was estimated at 625 SMEs; following Krejcie and Morgan [35], a sample of 234 was required. Probability (simple random) sampling was used to select respondent firms from various industries. A self-administered questionnaire was distributed through Google Forms to owners and managers, and 234 usable responses were collected over a two-month period.

B. Instrument and Measures

The questionnaire comprised three sections. Section A captured respondent and firm demographics. Section B measured SSCM practices with five items for each dimension: social sustainability (fair labour practices, community engagement, employee training and development, workforce diversity and inclusion, and partners' adherence to ethical sourcing); economic sustainability (assessment of suppliers' economic viability, investment in cost-efficient technologies, long-term financial planning with sustainability in mind, regular financial assessment of supply chain partners, and cost savings through efficient resource management); and environmental sustainability (eco-friendly packaging, waste minimisation, monitoring and reducing the carbon footprint of logistics, use of renewable resources, and compliance with environmental regulations). Section C measured performance improvement with nine items: operational efficiency, customer satisfaction, cost reduction, company reputation, sales or market share, employee morale, supply chain disruptions, product quality and overall performance. All items used a five-point Likert scale (1 = strongly disagree to 5 = strongly agree).

A pilot test with 20 respondents (approximately 10% of the sample) confirmed that the items were understandable, with no missing data and a Cronbach's alpha of 0.957 across the 24 items, exceeding the 0.70 threshold [36], [34].

C. Data Analysis

Data were analysed with SPSS version 29.0.1. Descriptive statistics summarised the respondent profile and item responses; Cronbach's alpha assessed internal consistency; Pearson correlation examined the strength and direction of relationships among variables; and multiple regression tested the hypotheses using the model $Y = a + b1X1 + b2X2 + b3X3$, where Y is performance improvement and $X1$, $X2$ and $X3$ are social, economic and environmental sustainability, respectively. Hypotheses were accepted at $p < 0.05$.

RESULTS

A. Respondent Profile

Table I summarises the profile of the 234 respondents. Gender was nearly balanced (51.7% female). Most respondents were aged 26–35 years (40.2%) and held managerial positions, with operation managers forming the largest group (26.5%). Firms employing 20–39 (35.5%) and 40–59 workers (33.8%) dominated the sample, and most had operated for 5–15 years (67.1%), indicating a relatively mature, mid-stage SME population.

TABLE I RESPONDENT PROFILE (N = 234)

Characteristic	Frequency	%
Gender		
Female	121	51.7
Male	113	48.3
Age		
18–25 years	52	22.2
26–35 years	94	40.2
36–45 years	62	26.5
46–55 years	16	6.8
Above 55 years	10	4.3
Position		
Operation manager	62	26.5
Assistant manager	54	23.1
Executive	52	22.2
Senior manager	41	17.5
Owner	25	10.7
Number of employees		
Less than 20	27	11.5
20–39	83	35.5
40–59	79	33.8
60 and above	45	19.2
Years in operation		
Less than 5	35	15.0
5–10	77	32.9
11–15	80	34.2
16 and above	42	17.9

B. Descriptive Statistics and Reliability

Table II reports the range of item means and standard deviations for each construct. All item means lay between 3.07 and 3.49, indicating moderate agreement that SSCM practices were implemented and that performance had improved. Among the practices, the highest item means were recorded for assessing the economic viability of suppliers (3.47), fair labour practices (3.41) and eco-friendly packaging (3.38). The 24-item scale showed a Cronbach's alpha of 0.993 for the main study, indicating excellent internal consistency.

TABLE II DESCRIPTIVE STATISTICS OF CONSTRUCTS

Construct	Items	Mean range	SD range
Social sustainability	5	3.08–3.41	1.111–1.475
Economic sustainability	5	3.23–3.47	1.221–1.417
Environmental sustainability	5	3.24–3.38	1.196–1.331
Performance improvement	9	3.07–3.49	1.213–1.467

Cronbach's alpha (24 items) = 0.993; pilot test (n = 20) = 0.957.

C. Correlation Analysis

As shown in Table III, all three sustainability dimensions were positively and significantly correlated with performance improvement ($p < 0.001$). The correlations were very strong for economic ($r = 0.978$),

environmental (r = 0.974) and social sustainability (r = 0.956). The independent variables were also very highly inter-correlated (r = 0.958–0.968).

TABLE III PEARSON CORRELATIONS BETWEEN VARIABLES

Variable	SO	ECO	ENV	PI
Social (SO)	1			
Economic (ECO)	0.961**	1		
Environmental (ENV)	0.958**	0.968**	1	
Performance (PI)	0.956**	0.978**	0.974**	1

** Significant at the 0.01 level (2-tailed); N = 234.

D. Multiple Regression and Hypothesis Testing

The regression model was significant ($F(3, 230) = 2404.688$, $p < 0.001$) and explained 96.9% of the variance in performance improvement ($R = 0.984$, $R^2 = 0.969$, adjusted $R^2 = 0.969$, standard error of the estimate = 0.217). Table IV presents the coefficients. Economic sustainability had the strongest effect ($\beta = 0.531$, $t = 10.216$, $p < 0.001$), followed by environmental sustainability ($\beta = 0.404$, $t = 7.990$, $p < 0.001$). Social sustainability had a positive but non-significant effect ($\beta = 0.059$, $t = 1.282$, $p = 0.201$). The estimated equation is $Y = 0.021 + 0.058X1 + 0.529X2 + 0.408X3$. Hence, H2 and H3 were supported, whereas H1 was not supported.

TABLE IV REGRESSION COEFFICIENTS AND HYPOTHESIS RESULTS

Path	B	SE	β	t	p	Result
(Constant)	0.021	0.041	–	0.518	0.605	–
H1: SO → PI	0.058	0.046	0.059	1.282	0.201	Not supported
H2: ECO → PI	0.529	0.052	0.531	10.216	<0.001	Supported
H3: ENV → PI	0.408	0.051	0.404	7.990	<0.001	Supported

Dependent variable: performance improvement (PI). $R^2 = 0.969$; $F(3, 230) = 2404.688$, $p < 0.001$.

DISCUSSION: IMPLICATIONS FOR SUSTAINABLE HALAL SUPPLY CHAIN DEVELOPMENT

The results show that the three TBL dimensions do not contribute equally to SME performance. This section interprets each finding and draws out its implications for the development of sustainable halal supply chains. Because the sample was not restricted to halal-certified firms, these implications are offered as theoretically grounded propositions rather than direct empirical tests.

A. Economic Sustainability as the Foundation

Economic sustainability was the strongest predictor of performance improvement, supporting prior evidence that SSCM practices improve financial and operational outcomes [25], [26] and that sustainable business models create new value through efficiency and waste reduction [32]. For SMEs with limited resources, practices that deliver visible cost savings and secure the viability of suppliers and partners offer the most immediate returns.

For halal supply chains, this finding is especially relevant. Maintaining halal integrity involves real costs—segregated storage and transport, dedicated handling, supplier verification and certification [8], [17]. The economic items in this study—assessing suppliers' economic viability, regular financial assessment of partners and long-term financial planning—are the same capabilities that allow an SME to sustain a reliable network of halal-compliant suppliers over time. Economic sustainability can therefore be viewed as an enabler of halal integrity: a halal supply chain that is not economically viable is unlikely to remain compliant.

B. Environmental Sustainability as an Extension of Toyyib

Environmental sustainability also had a significant positive effect, consistent with evidence that green practices reduce costs and strengthen competitiveness [33], [21] and improve SME performance [16], [20]. Eco-friendly packaging, waste minimisation, carbon monitoring and regulatory compliance appear to bring tangible operational and reputational benefits to SMEs in Kuala Lumpur.

From a *halalan toyyiban* perspective, these practices extend the *toyyib* requirement from the product to the process. Cleanliness, safety and avoidance of harm are intrinsic to *toyyib*, and they align closely with hygienic packaging, waste control and responsible logistics. Since halal integrity depends on controlling contamination risk across storage, transport and packaging [9], [10], environmental and halal assurance practices can be designed as complementary rather than separate systems [12].

C. Social Sustainability: Indirect and Long-Term

Social sustainability showed a very strong bivariate correlation with performance ($r = 0.956$) but no significant unique effect in the regression model. Several explanations are plausible. SMEs operate with tighter budgets and may prioritise practices with immediate returns; the benefits of social practices—such as reputation, trust and employee commitment—tend to be indirect and long-term [30], [31]; and conventional non-financial indicators may not fully capture them. In addition, the very high correlations among the three dimensions mean that much of the variance associated with social practices is shared with economic and environmental practices, which limits the unique effect that can be attributed to social sustainability.

For halal supply chains, this finding should not be read as a reason to neglect social practices. Fair labour, ethical sourcing, employee welfare and honest dealing are core to the ethical foundations of *halalan toyyiban* and to consumer trust in halal claims [7], [11]. Their performance contribution is more likely to operate through trust, legitimacy and integrity than through short-term efficiency, suggesting that future halal supply chain performance measures should incorporate trust- and integrity-related indicators.

D. Practical and Policy Implications

For SME managers, the results suggest a sequenced approach: economically and environmentally oriented practices can serve as an entry point that generates early performance benefits, while social practices are embedded for long-term legitimacy. For halal SMEs, sustainability practices should be integrated into existing halal assurance systems rather than managed separately. For policymakers and halal development agencies, the findings support extending halal development programmes beyond certification to include incentives, training and guidance on cost-efficient and environmentally responsible supply chain practices, so that halal performance is understood to include responsible, efficient and resilient business practices.

CONCLUSIONS

This study examined the effects of social, economic and environmental SSCM practices on the non-financial performance improvement of 234 SMEs in Kuala Lumpur and discussed the implications for sustainable halal supply chain development. Economic and environmental sustainability significantly improved SME performance, with economic sustainability being the most influential dimension, whereas social sustainability had no significant direct effect. The study concludes that developing an effective halal supply chain requires a broader management approach that integrates halal requirements with economic, environmental and social sustainability, so that halal performance extends beyond certification and compliance.

The study has several limitations. The sample was drawn from SMEs in Kuala Lumpur and was not restricted to halal-certified firms, so the halal implications are interpretive and require empirical validation. The cross-sectional, self-reported design limits causal inference. Moreover, the very high correlations among the sustainability dimensions indicate possible multicollinearity and overlapping constructs, so the relative size of the coefficients—particularly the non-significance of social sustainability—should be interpreted with caution. Future studies should test the framework among halal-certified SMEs; incorporate halal integrity, traceability,

certification practices and *halalan toyyiban* orientation as specific variables; assess discriminant validity and multicollinearity using structural equation modelling; adopt longitudinal designs; extend the scope to other states and industries in Malaysia; and use qualitative methods to capture how SME owners understand the link between halal and sustainability.

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