IMPACT OF SUPPLIER RELATIONSHIP MANAGEMENT AND TRUST ON BATAM SUPPLY CHAIN SUSTAINABILITY

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Abstract

Supply chain sustainability has become a critical concern for industries in Batam City due to increasing global environmental standards. However, the mechanism of how Supplier Relationship Management (SRM) influences sustainability remains underexplored, particularly regarding the role of Trust. This study aims to analyze the role of Trust as a moderating variable in the relationship between Supplier Relationship Management and Supply Chain Sustainability in Batam City. Data were collected using a sampling approach based on the formula by Hair et al. (2019). The questionnaire consisted of demographic information and 18 items related to SRM, Supply Chain Sustainability, and Trust. Following the guideline to multiply items by ten, a total of 180 respondents were sampled. The data were analyzed using SPSS for descriptive statistics and SmartPLS for structural equation modeling. The empirical results indicate that while SRM positively influences sustainability, Trust does not strengthen the relationship between Supplier Relationship Management and Supply Chain Sustainability. This suggests that trust is not a decisive factor in enhancing the impact of SRM in this context. Consequently, these findings imply that companies in Batam should prioritize strengthening operational SRM protocols and technical collaboration rather than relying solely on relational trust to drive sustainability performanc.

Keywords: *Supplier Relationship Management, Trust, Supply Chain Sustainability, Batam City, SmartPLS.*

INTRODUCTION

Supply chain sustainability (SCS) has become an increasingly important issue in the modern business world, shifting from a mere "green" initiative to a core strategic necessity for global competitiveness, Sustainability is no longer an option but a requirement for long-term operational survival (Srivastava, 2007). This concept stresses the integration of practices that consider the environmental, social, and economic impacts from business activities throughout the entire supply chain. In this context, SCS is not only the responsibility of manufacturers or suppliers, but it also involves various parties including distributors, inventory management teams, retailers, and customers to create an efficient and responsible supply chain (Kiryanto et al., 2021). As an international industrial hub and a Free Trade Zone, Batam City faces unique challenges in maintaining these standards while catering to multinational clients who demand rigorous sustainability compliance. The geographical position of Batam makes it a critical node in regional supply chains, necessitating a deeper understanding of how local companies manage their external partnerships to meet global sustainability benchmarks.

Supplier Relationship Management (SRM) plays a crucial role in achieving supply chain sustainability. According to Diener & Špaček (2021), SRM relates to managing mutually beneficial relationships between companies and their strategic supplier partners. This approach aims to achieve higher levels of innovation and competitive advantage than what could be accomplished independently or through traditional purchasing arrangements (Abbas et al., 2020). Within the context of SCS, SRM fosters stronger collaboration among all stakeholders, thereby reducing waste, promoting efficient use of resources, and increasing transparency across processes (Sheikholeslami et al., 2021). However, even though SCS has

become a major priority, there is still inconsistency in the implementation of sustainability practices among suppliers. Oftentimes, small and medium-sized enterprises (SMEs) suppliers face resource and knowledge limitations that hinder their ability to adopt sustainability initiatives expected by larger companies (Segura-Salazar et al., 2019). This creates a significant gap between corporate expectations and the real world, which can ultimately hinder the achievement of overall sustainability objectives in regions like Batam.

Trust plays an important role in managing relationships between companies and suppliers. Joshi (2024) states that trust is built through experience, interaction, and consistency from a company. In the context of SRM, trust makes open communication, minimized conflicts, and better collaboration more possible. However, many companies still think the relationship is merely a business transaction, without realizing that building trust can bring collaboration and commitment to sustainability initiatives (Wu et al., 2022). Theoretically, this research is grounded in the Resource-Based View (RBV) and Social Exchange Theory. RBV suggests that sustainable supply chain practices can be a source of competitive advantage when supported by intangible resources like strong supplier relationships, while Social Exchange Theory posits that trust is the primary driver of long-term cooperation. There is an important gap in understanding how trust can influence the effectiveness of SRM in supporting SCS. Previous studies often do not explore in depth how trust functions as a bridge or a catalyst between SRM and SCS. Therefore, there is a need to examine further the role of trust in improving SRM effectiveness and its contribution towards supply chain sustainability.

In this research, the author proposes trust as a moderating variable between SRM and SCS. This means that a trusting relationship is expected to strengthen the effectiveness of SRM, which consequently supports the achievement of SCS. By investigating this moderating link, the study aims to provide a deeper understanding of whether the "human element" of trust is a mandatory condition for SRM to produce sustainable outcomes in the Batam industrial context. Furthermore, this research aims to provide a significant contribution to academic literature and business practice. By explaining the relationship between SRM, trust, and SCS, this research not only enriches theoretical understanding but also offers practical guidance for managers in building stronger and more sustainable relationships with suppliers. It is expected that the findings of this research can help companies design more effective SRM strategies, which will ultimately lead to better and more consistent sustainability achievements throughout the supply chain.

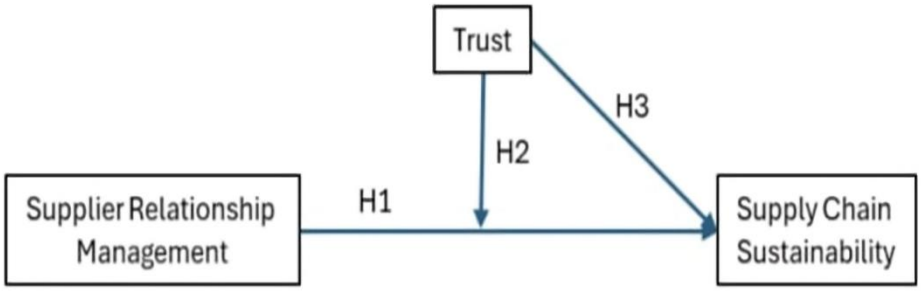

Figure 1. Research Framework

Based on the proposed framework, several hypotheses are developed with supporting research to guide this empirical study. The first hypothesis (H1) posits that Supplier Relationship Management (SRM) has a positive impact toward Supply Chain Sustainability (SCS), The integration within the supply chain is a foundational capability that enables organizations to reach higher sustainability performance (Huo et al., 2019). SRM has been

researched extensively and is found to have a positive impact on supply chain performance, including the sustainability aspect. Through managing relationships effectively with suppliers, companies can ensure the implementation of practices that support sustainability. SRM enables companies to more easily implement sustainability initiatives with supplier support, fostering waste reduction and promoting the efficient use of resources. This direct relationship is fundamental to the industrial ecosystem in Batam, where high-speed production must be balanced with environmental accountability (Lechler et al., 2019).

The second hypothesis (H2) suggests that Supplier Relationship Management (SRM) has a positive impact towards trust. A well-managed relationship can build trust between companies and suppliers as emphasized by Joshi (2024). When SRM processes are transparent and mutually beneficial, trust is built through consistent positive interaction. This trust is crucial because it enables better collaboration, transparency, and effective communication in carrying out various sustainable supply chain activities. Without a solid management framework, trust is difficult to establish, as suppliers may feel vulnerable or exploited in a purely transactional environment. Therefore, SRM serves as the foundation upon which inter-organizational trust is constructed.

Finally, the third hypothesis (H3) introduces the moderating effect, proposing that trust has a positive impact towards the strength of Supply Chain Sustainability (SCS) implementation. Trust in supplier relationships makes it possible for open communication that supports sustainable practices. When companies and suppliers trust each other, they are more likely to support environmentally friendly initiatives and positively impact supply chain sustainability (Lechler et al., 2019). In this context, trust is expected to act as a catalyst that enhances the effect of SRM practices on sustainability outcomes. If trust is high, the impact of management practices on sustainability will be maximized; however, if trust is absent, even the most advanced SRM protocols may fail to achieve long-term sustainability goals. By formulating these hypotheses, the author hopes that this research is able to provide a deeper understanding of the role of trust in managing supplier relationships within a globalized manufacturing hub.

METHODS

This research design employs a quantitative approach to objectively evaluate the relationships between variables through numerical data analysis. The descriptive method aims to describe the phenomena that become the focus of the research in detail, ensuring that the results are both valid and reliable (Ahmed, 2024). The primary objective of this quantitative research is to measure the statistical connections between variables using numerical and statistical approaches (Amirshenava & Osanloo, 2019). Data were collected through surveys and questionnaires distributed to potential respondents, then analyzed statistically to test the hypotheses. The distribution was carried out via Google Forms and direct physical surveys to professionals in Batam City, including directors, managers, logistics staff, administrators, and procurement personnel. The questionnaire was structured into two parts: respondent demographics and 18 statements measuring Supplier Relationship Management (SRM), Trust, and Supply Chain Sustainability (SCS). To ensure a robust sample size, the study followed the guideline of multiplying the number of items by ten, resulting in a required sample size of 180 respondents (Hair et al., 2019).

[Tab] The operational variables are grounded in established theoretical frameworks to ensure conceptual clarity. Supplier Relationship Management refers to managing two-way, mutually beneficial relationships with strategic supplier partners to achieve higher levels of innovation and competitive advantage (Joshi, 2024). Supply Chain Sustainability is viewed as more than just the responsibility of manufacturers or suppliers; it involves a collaborative effort from distributors, inventory management, retailers, and customers to ensure resource

efficiency, waste reduction, and process transparency (Zhang et al., 2022). Furthermore, Trust is defined as the confidence that develops through a company's experience, interactions, and consistency (Joshi, 2024). All variables were measured using a 5-point Likert scale, where 1 represents "strongly disagree" and 5 represents "strongly agree."

[Tab] Statistical analysis was conducted using a two-stage approach involving SPSS version 27 and SmartPLS version 3.0. Descriptive analysis was performed using SPSS to present information regarding practices, policies, and populations clearly. Subsequently, Structural Equation Modeling (PLS-SEM) was applied using SmartPLS 3.0. This research applies PLS-SEM because the model tested is a development of models from previous research (Hair et al., 2019). The analysis evaluates the measurement model (outer model) to assess the relationship between indicators and latent constructs, as well as the structural model (inner model) to determine relationships between variables. In the outer model testing, convergent validity is considered good if the Outer Loading is ≥ 0.7, though values between 0.5 and 0.7 are acceptable if the Average Variance Extracted (AVE) meets the required threshold. Reliability was measured using Cronbach's Alpha and Composite Reliability, with Hair et al. (2020) recommending Composite Reliability for better parameter estimation accuracy with a minimum threshold of 0.7. Discriminant validity was further verified using the Fornell-Larcker criterion and Cross-Loading analysis.

[Tab] To safeguard data integrity, Common Method Bias (CMB) was identified through multiple techniques (Podsakoff et al., 2025). This includes Harman's Single-Factor Test, where CMB is insignificant if the first factor accounts for less than 50% of the total variance (Chen & Ding, 2025). Full Collinearity Assessment was also conducted using the Variance Inflation Factor (VIF), where a model is free from CMB if all VIF values are below 3.3. Additionally, Confirmatory Factor Analysis (CFA) was utilized to test the suitability of the structure; a CFI value greater than 0.9 or RMSEA below 0.08 indicates a good model fit (Hair et al., 2020). The Marker Variable Approach was also considered to detect shared method variance by examining relationships between theoretically unrelated constructs (Podsakoff et al., 2025). Finally, the inner model was evaluated to determine the significance of direct relationships using T-statistics (> 1.96) or P-values (< 0.05). The explanatory power was measured through the R-Squared coefficient (R2), while the overall model quality was validated using the Goodness of Fit (GoF) index based on the thresholds established by Hair et al. (2019).

RESULT AND DISCUSSION

The primary findings of this research indicate that Supplier Relationship Management (SRM) and Trust both exert a significant positive influence on Supply Chain Sustainability (SCS) within the automotive industry in Batam. However, the empirical analysis demonstrates that Trust does not function as a moderating variable in the relationship between SRM and SCS. These results suggest that while trust and management practices are essential independent drivers of sustainability, the effectiveness of SRM protocols in companies like Toyota, Honda, and Suzuki is governed by standardized operational procedures rather than being contingent upon the level of inter-organizational trust.

Table 1. Statistic

		Gender	Age	Length of Employment	Income	Last Educational Level	Company
N	Valid	289	289	289	289	289	289
	Missing	0	0	0	0	0	0

Table 2. Gender

		Frequency	Percentage	Valid Percent	Cumulative Percent
Valid	Male	207	71.6	71.6	71.6
	Female	82	28.4	28.4	100
	Total	289	100	100	

Table 3. Age

		Frequency	Percentage	Valid Percent	Cumulative Percent
Valid	<20 year	8	2.8	2.8	2.8
	>40 year	19	6.6	6.6	9.3
	20-30 year	219	75.8	75.8	85.1
	31-40 year	43	14.9	14.9	100
	Total	289	100	100	

Table 4. Length of Employment Level

		Frequency	Percentage	Valid Percent	Cumulative Percent
Valid	<1 year	36	12.5	12.5	12.5
	>year	47	16.3	16.3	28.7
	1-2 year	155	53.6	53.6	82.4
	3-4 year	51	17.6	17.6	100
	Total	289	100	100	

Table 5. Income

		Frequency	Percentage	Valid Percent	Cumulative Percent
Valid	<Rp 4.000.000	23	8	8	8
	>Rp 6.000.000	47	16.3	16.3	24.2
	Rp 4.000.000 - Rp5.000.000	172	59.5	59.5	83.7
	Rp 5.000.000 - Rp 6.000.000	47	16.3	16.3	100
	Total	289	100	100	

Table 6. Last Educational level

		Frequency	Percentage	Valid Percent	Cumulative Percent
Valid	DIPLOMA	16	5.5	5.5	5.5
	S1	38	13.1	13.1	18.7
	SMA/SMK	232	80.3	80.3	99
	SMP	3	1	1	100
	Total	289	100	100	

Table 7. Company

		Frequency	Percentage	Valid Percent	Cumulative Percent
Valid	Honda	121	41.9	41.9	41.9
	Suzuki	67	23.2	23.2	65.1
	Toyata	101	34.9	34.9	100
	Total	289	100	100	

Based on the descriptive analysis involving 289 respondents from Toyota, Honda, and Suzuki, the demographic profile shows a workforce dominated by males (71.6%) within the 20–30 age range (75.8%). As described in Table 2 through Table 8, the majority of the participants are relatively new employees with 1–2 years of experience (53.6%) and earn a monthly income aligned with the regional minimum wage of Rp 4,000,000 to Rp 5,000,000 (59.5%). In terms of education, 80.3% of respondents hold a high school (SMA/SMK) background, reflecting the operational nature of the automotive manufacturing sector in the Batam Free Trade Zone.

Table 8. Validity Test

Indicator	Outer Loadings	Average Variance Extracted (AVE)	Description
SCS1	0.738	0.625	Valid
SCS2	0.813		
SCS3	0.8		
SCS4	0.807		
SCS5	0.797		
SCS6	0.787		
SRM1	0.769	0.616	Valid
SRM2	0.778		
SRM3	0.783		
SRM4	0.807		
SRM5	0.801		
SRM6	0.77		
T1	0.74	0.629	Valid
T2	0.842		
T3	0.827		
T4	0.757		
T5	0.793		
T6	0.792		

The validity and reliability of the research model were assessed using the criteria established by Ahmed (2024). As shown in Table 9, all indicators achieved Outer Loading values above 0.70, and every variable exceeded the Average Variance Extracted (AVE)

threshold of 0.50, confirming the model's convergent validity. Furthermore, as detailed in Table 10, the reliability testing resulted in Cronbach's Alpha and Composite Reliability values greater than 0.70 for all constructs, indicating high internal consistency and measurement accuracyThe validity and reliability of the research model were assessed using the criteria established by Ahmed (2024). As shown in Table 9, all indicators achieved Outer Loading values above 0.70, and every variable exceeded the Average Variance Extracted (AVE) threshold of 0.50, confirming the model's convergent validity. Furthermore, as detailed in Table 10, the reliability testing resulted in Cronbach's Alpha and Composite Reliability values greater than 0.70 for all constructs, indicating high internal consistency and measurement accuracy.

Table 9. Realibity Test

Variabel	Cronbach's Alpha	Composite Reliability
Supplier Relationship Management	0.875	0.906
Supply Chain Sustainability	0.88	0.909
TRUST	0.881	0.91

Table 10. Hypotheses Testing

Hypotheses	Sample Mean (M)	P-Values	Result
Moderating Effect 1 -> Supply Chain Sustainability	-0.026	0.212	Insignificant
Supplier Relationship Management -> Supply Chain Sustainability	0.302	0	Significant
TRUST -> Supply Chain Sustainability	0.482	0	Significant

The empirical results from the structural model, summarized in Table 11, confirm that SRM has a significant positive impact on SCS (Sample Mean = 0.302, $P < 0.05$). This is consistent with the Resource-Based View (RBV) theory, which posits that strategic supplier relationships serve as intangible resources that drive competitive and sustainable advantage. Similarly, Trust was found to have a significant positive impact on SCS (Sample Mean = 0.482, $P < 0.05$), supporting the Social Exchange Theory which suggests that trust fosters the open communication necessary for environmental and social governance (Joshi, 2024).

However, the moderating effect of Trust on the relationship between SRM and SCS was found to be insignificant (Sample Mean = -0.026, $P = 0.212$). This finding implies that the strength of the relationship between management practices and sustainability outcomes does not vary regardless of the level of trust present. This lack of significance is likely due to the highly formalized nature of the automotive sector, where sustainability initiatives are dictated by Standard Operating Procedures (SOPs), international ISO standards, and rigid contractual obligations. Unlike more flexible industries, automotive firms in Batam rely on "compliance-based" mechanisms where sustainability is a mandatory requirement of the global supply chain, thus bypassing the need for trust to act as a catalyst, While relational aspects are often highlighted, the formal management of sustainability risks often precedes the necessity of trust-based moderation (Li et al., 2019). This finding provides a unique contribution to the literature by suggesting that in high-compliance environments, formalization may replace relational moderation in achieving sustainability objectives.

CONCLUSION

This research concludes that Supplier Relationship Management (SRM) and Trust are critical independent drivers that significantly enhance Supply Chain Sustainability (SCS) in the automotive sector of Batam City. The SEM-PLS analysis demonstrates that effective collaboration and high integrity between companies and their suppliers directly lead to more efficient and responsible sustainability practices. However, this study reveals that Trust does not function as a moderating variable; the statistical results prove that the impact of SRM on sustainability outcomes is not contingent upon or strengthened by the level of trust. This suggests that in Batam's highly regulated manufacturing environment, sustainability is governed by rigid operational standards and independent relational values rather than trust acting as a catalyst for management protocols.

Based on these findings, it is recommended that manufacturing companies in Batam prioritize the consistent implementation of SRM through long-term, collaborative communication while simultaneously fostering trust through transparency and the fulfillment of commitments. Managers should treat trust as a standalone strategic asset that directly improves social and environmental performance. For future academic development, researchers are encouraged to adopt a longitudinal approach to observe these dynamics over a longer period. Additionally, incorporating variables such as technological innovation or supply chain risk would provide a more comprehensive understanding of the evolving factors that influence industrial sustainability in global free trade zones, Future studies should also explore the barriers and drivers of circular economy practices within these industrial nodes to achieve a more comprehensive sustainability framework (Govindan & Hasanagic, 2018).

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