福建省中电海峡智能装备研究院
Fujian Zhongdian Straits Institute of Intelligent Equipment

Asia Pacific Science Press

The Impact of Logistics and Supply Chain Management on the Sustainable Growth of Shenzhen's Cross-Border E-commerce: The Mediating Role of Trust

Qiu Chao[1]*, MOHAMAD IDRAKISYAH ABDULLAH[2]

1.City University Malaysia (City U), Petaling Jaya, Selangor, 46100, Malaysia

2.City Graduate School, City University Malaysia (City U), Petaling Jaya, Selangor, 46100, Malaysia

*Corresponding author: Qiu Chao, qiuchao951103@163.com

Abstract: This study investigates the intricate relationship between logistics and supply chain management, consumer trust, and the sustainable growth of cross-border e-commerce enterprises in Shenzhen, China. As a global hub for manufacturing and trade, Shenzhen's cross-border e-commerce sector has experienced exponential growth, yet faces significant challenges in achieving long-term sustainability amidst fierce competition and rising consumer expectations. This paper posits that the operational effectiveness of logistics and supply chain management is a fundamental driver of sustainable growth, not merely through cost and efficiency gains, but more critically, through its role in building consumer trust. Using a quantitative approach, survey data was collected from 350 consumers with recent cross-border purchasing experiences from Shenzhen-based firms. The study measures three core constructs: Logistics and Supply Chain Performance (LSP), Consumer Trust, and Sustainable Growth (measured via customer loyalty and repurchase intentions). Statistical analysis, including descriptive statistics, correlation analysis, and mediation analysis using structural equation modeling, was employed to test the proposed hypotheses. The findings reveal a strong, positive correlation between LSP and sustainable growth. More importantly, the results of the mediation analysis confirm that consumer trust plays a significant mediating role in this relationship. The indirect effect of LSP on sustainable growth via trust is statistically significant, suggesting that the true value of an efficient supply chain lies in its ability to foster a reliable and secure customer experience, which in turn cultivates the loyalty essential for long-term success. This paper contributes to the literature by empirically validating trust as a key mechanism through which operational capabilities are translated into sustainable competitive advantage in the cross-border e-commerce context. The findings offer practical implications for managers, highlighting the need to strategically invest in logistics infrastructure and transparent processes as a means of building brand equity and ensuring enduring growth.

Keywords: Cross-Border E-commerce; Logistics Management; Supply Chain Management; Sustainable Growth; Consumer Trust; Shenzhen

1.Introduction

The proliferation of digital technologies and the globalization of markets have catalyzed the dramatic rise of cross-border e-commerce, transforming the landscape of international trade and consumer behavior. China, in particular, has emerged

as the world's largest and most dynamic e-commerce market[1], with cities like Shenzhen at the forefront of this revolution. Positioned as China's first Special Economic Zone and a global technology and manufacturing powerhouse, Shenzhen provides a fertile ground for cross-border e-commerce businesses to thrive[2], benefiting from its extensive industrial base, advanced infrastructure, and supportive government policies. However, as the market matures and competition intensifies, the initial drivers of growth, such as price advantages, are becoming less effective[3]. The focus is now shifting towards achieving sustainable growth, which transcends short-term revenue gains and encompasses long-term customer loyalty, brand reputation, and operational resilience. In this highly competitive environment[4], the efficiency and reliability of logistics and supply chain management have become paramount. The process of moving goods across international borders—from warehousing and order fulfillment to customs clearance and last-mile delivery—is fraught with complexities that can significantly impact the customer experience. A single delayed shipment or a lost package can irrevocably damage a customer's perception of a brand. Therefore[5], superior logistics performance is no longer a mere operational necessity but a strategic imperative for differentiation and survival[6]. This paper argues that the influence of logistics and supply chain management on sustainable growth extends beyond direct operational metrics. We propose that its most critical contribution lies in its capacity to build and maintain consumer trust. In the impersonal and often uncertain context of online shopping[7], especially across borders, trust acts as the fundamental currency that underpins customer relationships. A seamless, transparent, and reliable delivery experience serves as a tangible signal of a company's competence and integrity, thereby reducing the consumer's perceived risk and fostering a sense of confidence[8]. This study aims to empirically investigate this dynamic by examining the mediating role of trust in the relationship between logistics and supply chain performance and the sustainable growth of Shenzhen's cross-border e-commerce enterprises[9]. By doing so, we seek to provide valuable insights for both academics and practitioners on how to leverage operational excellence to build the relational capital necessary for enduring success in the global digital marketplace[10].

2.Theoretical Framework and Hypotheses

2.1 The Nexus of Cross-Border E-commerce and Sustainable Growth

Sustainable growth in the context of cross-border e-commerce is a multifaceted concept that moves beyond traditional financial metrics like revenue and profit margins. While economic viability is essential, sustainability implies a long-term perspective focused on creating enduring value, fostering customer relationships, and building a resilient business model that can adapt to market volatility. For e-commerce firms, this means cultivating a loyal customer base that engages in repeat purchases, generates positive word-of-mouth, and exhibits strong brand allegiance. This form of growth is inherently more stable and profitable than growth driven by constant customer acquisition through aggressive marketing, which is often costly and yields diminishing returns. The challenges to achieving this in the cross-border sphere are substantial. Firms must navigate disparate regulatory environments, fluctuating exchange rates, cultural and language barriers, and intense global competition. Shenzhen's e-commerce ecosystem provides a compelling case study, as its firms have rapidly scaled by leveraging the region's manufacturing prowess, but now face the critical challenge of transitioning from a model based on low-cost production to one based on brand value and customer experience. The literature suggests that this transition is contingent upon developing core competencies in areas that directly touch the customer, with logistics being a primary interface. Therefore, sustainable growth is conceptualized in this study not just as an increase in sales, but as the outcome of a firm's ability to consistently meet or exceed customer expectations, thereby fostering the loyalty that ensures its long-term market presence and profitability.

2.2 Logistics and Supply Chain Management as a Strategic Capability

Logistics and supply chain management in cross-border e-commerce encompasses the entire physical and informational flow of a product, from the supplier's warehouse to the international consumer's doorstep. This includes inventory management, order processing, packaging, international transportation, customs brokerage, and, crucially, last-mile delivery and returns management. Each stage presents unique challenges that can lead to delays, increased costs, and customer dissatisfaction. For instance, inefficient customs clearance can leave packages stranded for weeks, while poor last-mile delivery services can result in lost or damaged goods, both of which severely undermine the customer experience. Consequently, leading firms

are increasingly viewing their supply chains not as a cost center to be minimized, but as a strategic weapon for creating competitive advantage. A highly efficient and transparent supply chain can offer faster delivery times, provide real-time tracking visibility, ensure product integrity through superior packaging, and offer hassle-free returns. These operational outcomes translate directly into tangible benefits for the consumer, enhancing the overall value proposition. In this research, Logistics and Supply Chain Performance (LSP) is defined as the perceived effectiveness and reliability of these processes from the consumer's perspective. It is hypothesized that a higher level of LSP will have a direct and positive impact on the sustainable growth of an e-commerce firm by enhancing customer satisfaction and encouraging repeat business.

2.3 The Foundational Role of Consumer Trust in E-commerce

Trust is a cornerstone of all commercial relationships, but its importance is magnified in the context of e-commerce, and even more so in cross-border transactions. E-commerce is characterized by information asymmetry and a lack of physical interaction, which elevates the consumer's sense of vulnerability and perceived risk. Consumers must place their faith in a distant, often unfamiliar seller, believing that they will receive the product as described, in a timely manner, and that their financial information will be secure. Trust is the psychological state that allows a consumer to accept this vulnerability based on positive expectations of the intentions or behavior of the seller. It acts as a cognitive shortcut, simplifying the decision-making process by reducing the need to constantly evaluate a seller's credibility. In the cross-border context, this uncertainty is amplified by concerns about product authenticity, long shipping durations, complex return procedures, and a lack of recourse in case of disputes. Building trust is therefore not an option but a prerequisite for success. It is cultivated through consistent and reliable actions over time. When a firm consistently delivers on its promises—shipping orders promptly, providing accurate tracking information, and handling issues professionally—it demonstrates its competence and benevolence, which are the core dimensions of trustworthiness. This study posits that the tangible performance of the logistics and supply chain is one of the most powerful signals a firm can send to build this trust.

2.4 The Mediating Effect of Trust

Building on the preceding arguments, this study's central hypothesis is that consumer trust acts as a critical mediator in the relationship between logistics and supply chain performance and sustainable growth. While efficient logistics can directly lead to positive outcomes like cost savings and faster service, which may encourage a repeat purchase, its more profound and lasting impact is channeled through the psychological mechanism of trust. A single successful transaction might be attributed to luck, but a consistent pattern of reliable and transparent delivery builds a deep-seated belief in the firm's reliability. This belief, or trust, is what transforms a satisfied customer into a loyal one. A loyal customer is more likely to repurchase, less sensitive to price fluctuations, more willing to try new products from the same brand, and more inclined to recommend the brand to others. These behaviors are the very definition of sustainable growth. Therefore, the proposed model is as follows: superior Logistics and Supply Chain Performance (the independent variable) directly enhances Consumer Trust (the mediating variable), which in turn fosters Sustainable Growth (the dependent variable). The logistics process is not just a physical delivery mechanism; it is a communication tool and a primary touchpoint for trust-building. The accuracy of the tracking update, the condition of the delivered package, and the ease of the return process are all tangible proofs of the company's commitment to the customer, which solidifies trust and ultimately secures its long-term viability.

3.Research Methodology

This study adopted a quantitative research design to empirically test the proposed conceptual model and hypotheses. The primary method for data collection was a structured online survey administered to consumers who had made a cross-border e-commerce purchase from a Shenzhen-based company within the last six months. This approach was chosen to capture recent and relevant consumer perceptions regarding logistics performance and trust. The survey instrument was developed based on established scales from prior literature in marketing, logistics, and information systems, and was adapted to the specific context of China's cross-border e-commerce. All scale items were measured using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). A pilot test was conducted with 30 participants to ensure the clarity, reliability, and validity of the questionnaire, leading to minor refinements in wording. The final survey was distributed through popular Chinese social media platforms and online shopping forums frequented by international shoppers. A total of

380 responses were received, and after screening for incomplete or invalid answers, 350 complete responses were retained for the final analysis, yielding a valid response rate of 92.1%. The data analysis was performed using SPSS 26.0 and AMOS 24.0. The process involved several stages: first, descriptive statistical analysis was used to summarize the demographic characteristics of the sample; second, reliability and validity tests were conducted to confirm the quality of the measurement scales; third, correlation analysis was performed to examine the relationships between the key variables; and finally, structural equation modeling (SEM) was employed to test the mediating effect of trust in the proposed model.

4.Results and Analysis

4.1 Respondent Profile and Descriptive Statistics

The demographic profile of the 350 respondents is summarized in Table 1. The sample comprised a slight majority of females (54.3%) over males (45.7%). The largest age group was 26-35 years old, representing 48.6% of the sample, which aligns with the typical demographic of active online shoppers. In terms of shopping frequency, a significant portion of the respondents (62.9%) reported making cross-border purchases at least once a month, indicating a high level of engagement with international e-commerce. This demographic composition suggests that the sample is representative of the target population of experienced cross-border consumers.

Table 1: Demographic Profile of Respondents (N=350)

Characteristic	Category	Frequency	Percentage (%)
Gender	Male	160	45.7
	Female	190	54.3
Age	18-25	85	24.3
	26-35	170	48.6
	36-45	75	21.4
	Above 45	20	5.7
Frequency	Less than once a month	130	37.1
	1-3 times a month	155	44.3
	More than 3 times a month	65	18.6

Descriptive statistics for the three core latent variables—Logistics and Supply Chain Performance (LSP), Consumer Trust (TR), and Sustainable Growth (SG)—are presented in Table 2. The mean scores for all three constructs were above the midpoint of 3.0, indicating generally positive perceptions among the respondents. Specifically, LSP had a mean of 3.85, Trust had a mean of 3.92, and Sustainable Growth had a mean of 3.98. The standard deviations were relatively small, suggesting a degree of consensus in the responses. The high mean scores, particularly for Trust and Sustainable Growth, indicate that consumers who have positive logistics experiences are indeed more likely to exhibit trust and loyalty.

Table 2: Descriptive Statistics of Key Variables

Variable	N	Min	Max	Mean	Std. Deviation
Logistics Performance (LSP)	350	2.10	5.00	3.85	0.65
Consumer Trust (TR)	350	2.25	5.00	3.92	0.71
Sustainable Growth (SG)	350	2.40	5.00	3.98	0.68

4.2 Correlation Analysis

To assess the relationships between the primary variables, a Pearson correlation analysis was conducted, with the results displayed in Table 3. The correlation matrix reveals significant positive correlations among all three constructs at the $p <$

0.01 level. The correlation between Logistics and Supply Chain Performance (LSP) and Sustainable Growth (SG) was strong and positive (r = 0.621, p < 0.01), providing preliminary support for the direct relationship hypothesis. Similarly, there was a very strong positive correlation between LSP and Consumer Trust (TR) (r = 0.714, p < 0.01), indicating that as perceived logistics performance improves, consumer trust increases significantly. Finally, the correlation between Consumer Trust (TR) and Sustainable Growth (SG) was the strongest of all (r = 0.789, p < 0.01), suggesting that trust is a powerful predictor of customer loyalty and repurchase intentions. These strong inter-correlations provide a solid foundation for proceeding with the mediation analysis, as they satisfy the prerequisite condition that the independent, mediating, and dependent variables are all significantly related.

Table 3: Correlation Matrix of Variables

Variable	1. LSP	2. TR	3. SG
1. Logistics Performance (LSP)	1		
2. Consumer Trust (TR)	0.714	1	
3. Sustainable Growth (SG)	0.621	0.789	1
Note: p < 0.01			

4.3 Mediation Analysis Results

The mediating role of trust was tested using the bootstrapping method in AMOS, which is a robust technique for assessing indirect effects. The analysis examined three pathways: the direct effect of LSP on SG (Path c'), the indirect effect of LSP on SG through TR (Path ab), and the total effect (Path c). The results of the mediation analysis are presented in Table 4. The model demonstrated a good fit to the data (χ^2/df = 2.45, CFI = 0.96, TLI = 0.95, RMSEA = 0.065). The analysis showed that the total effect of LSP on SG (Path c) was significant and positive (β = 0.63, p < 0.001). When the mediator, Trust, was introduced into the model, the direct effect of LSP on SG (Path c') remained significant but was substantially reduced (β = 0.25, p < 0.01). This reduction indicates that the relationship is partially mediated. The indirect effect of LSP on SG via Trust (Path ab) was found to be 0.38, and the 95% bias-corrected bootstrap confidence interval for this indirect effect was [0.29, 0.47]. Since this confidence interval does not contain zero, it confirms that the mediating effect of trust is statistically significant. The indirect effect (0.38) accounted for approximately 60.3% of the total effect (0.63), highlighting that a majority of the influence of logistics performance on sustainable growth is channeled through the building of consumer trust.

Table 4: Results of Mediation Analysis

Path	Description	Coefficient (β)	Std. Error	p-value	95% CI
Path a	LSP → TR	0.72	0.05	<0.001	[0.62, 0.82]
Path b	TR → SG	0.53	0.06	<0.001	[0.41, 0.65]
Path c'	LSP → SG (Direct Effect)	0.25	0.08	<0.01	[0.09, 0.41]
Indirect Effect	LSP → TR → SG	0.38	0.05	<0.001	[0.29, 0.47]
Total Effect	LSP → SG	0.63	0.07	<0.001	[0.49, 0.77]

5.Discussion

5.1 The Direct and Indirect Power of Logistics on Sustainable Growth

The findings of this study provide robust empirical evidence that Logistics and Supply Chain Performance (LSP) is a powerful antecedent to the sustainable growth of cross-border e-commerce firms in Shenzhen. The significant direct effect demonstrates that operational excellence in logistics creates immediate and tangible value that customers recognize and reward. When products arrive faster than expected, are packaged securely to prevent damage, and when tracking information is readily available and accurate, it enhances the overall consumption experience. This positive experience directly

influences a customer's decision to purchase from the same company again, contributing to customer retention, a key pillar of sustainable growth. However, the analysis reveals a more nuanced and powerful story. The substantial reduction of the direct effect when trust is introduced as a mediator indicates that the true strategic value of logistics is not fully captured by its direct operational outcomes alone. While a fast delivery is appreciated, its impact is amplified when it is interpreted by the consumer as a signal of the firm's reliability and customer-centricity. This interpretation is the genesis of trust, which transforms a transactional relationship into a relational one. The results strongly suggest that managers should not view investments in advanced logistics systems, such as real-time tracking technology or premium shipping partners, merely as a cost of doing business, but as a strategic investment in building the intangible asset of consumer trust, which yields long-term dividends.

5.2 Trust as the Central Mechanism for Value Conversion

The most critical finding of this research is the confirmation of consumer trust as a significant mediator. It acts as the essential psychological mechanism that converts the functional benefits of superior logistics into the relational outcomes that define sustainable growth, such as loyalty and positive word-of-mouth. In the high-stakes environment of cross-border e-commerce, where consumers face significant uncertainty, every aspect of the logistics process becomes a "moment of truth." A transparent and easy-to-navigate returns process, for example, does more than just facilitate the return of an unwanted item; it sends a powerful message that the company is confident in its products and is committed to customer satisfaction, even at a potential cost to itself. This act of perceived benevolence and integrity is instrumental in building trust. Similarly, proactive communication about a potential shipping delay, while delivering bad news, can paradoxically increase trust if handled transparently and professionally, as it demonstrates the company's honesty. The data shows that this trust, once established, is the strongest predictor of sustainable growth. A trusted firm is forgiven more easily for occasional mistakes, its marketing messages are received more favorably, and its customers become its advocates. Therefore, Shenzhen's e-commerce firms aiming for global leadership must recognize that the battle for sustainable growth is ultimately won not on the factory floor or in marketing campaigns alone, but in the last mile of delivery where promises are kept and trust is forged.

5.3 Strategic Implications for Shenzhen's E-commerce Ecosystem

The practical implications of these findings for the managers and policymakers within Shenzhen's vibrant cross-border e-commerce ecosystem are profound. First, e-commerce firms must fundamentally reframe their perspective on logistics, moving it from a back-office operational function to a core element of their brand and marketing strategy. Budgets for logistics should be seen as investments in customer relationship building. This includes investing in integrated IT systems that provide seamless tracking from warehouse to doorstep, forming strategic alliances with reputable global and local logistics providers, and designing customer-centric policies for shipping and returns. Second, there should be a relentless focus on transparency. Companies should proactively communicate all stages of the delivery process and be honest about potential delays. This transparency builds credibility and manages expectations, preventing the erosion of trust. Third, firms should leverage data from their supply chain to continuously improve. Analyzing delivery times, rates of damaged goods, and reasons for returns can provide invaluable insights into weaknesses in the logistics chain that, once addressed, can further enhance both performance and trust. For policymakers in Shenzhen, the findings suggest that supporting the development of a world-class logistics infrastructure, including smart warehouses, efficient customs clearance platforms, and a competitive ecosystem of last-mile delivery services, is crucial for the long-term, sustainable success of the city's e-commerce sector.

6.Conclusion

This study set out to explore the impact of logistics and supply chain management on the sustainable growth of cross-border e-commerce firms in Shenzhen, with a specific focus on the mediating role of consumer trust. The research has successfully demonstrated that while superior logistics performance has a direct, positive effect on growth, its more significant contribution is indirect, channeled through the crucial mechanism of building and maintaining consumer trust. The quantitative analysis of data from 350 consumers confirmed that a seamless, reliable, and transparent logistics experience is a primary driver in fostering a consumer's belief in a firm's integrity and competence. This trust, in turn, is the most powerful predictor of customer loyalty and repurchase intention, which are the cornerstones of sustainable growth. The findings

underscore a critical strategic lesson for the hyper-competitive cross-border e-commerce market: operational capabilities and relational capital are not separate domains but are deeply intertwined. The physical act of delivering a package is also the symbolic act of delivering on a promise, and it is in the consistent fulfillment of this promise that enduring customer relationships are built. While this study provides valuable insights, it is not without limitations. Its focus on the consumer perspective in Shenzhen means the findings may not be generalizable to other regions or to the perspective of business managers. Furthermore, its cross-sectional design captures a snapshot in time, whereas trust and loyalty are built over a longer period. Future research could address these limitations by adopting a longitudinal approach, conducting comparative studies across different e-commerce hubs, and incorporating the firm's perspective to create a more holistic model. Ultimately, as the digital economy continues to erase geographical borders, the principles of trust and reliability will remain the most enduring sources of competitive advantage. For the ambitious e-commerce enterprises of Shenzhen, the path to sustainable global leadership lies not just in what they sell, but in how they deliver.

Funding

Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

References

[1] Li, Y., & Ruan, Z. (2025). Optimization of logistics supply chain based on genetic algorithm and evolutionary game. Journal of Advanced Manufacturing Systems. (prepublish).

[2] Simm, N. (2025). Greener logistics through resource sharing: A resource dependency lens on supply chain interaction. Research in Transportation Business & Management, 61, 101405.

[3] W., M. K. C. S., Nicholas, C., Raufdeen, R., et al. (2025). Information processing model for quality assurance in reverse logistics supply chains of demolition waste. Engineering, Construction and Architectural Management, 32(13), 193–212.

[4] Yamoah, E. L., Mensah, O. R., & Frimpong, A. (2025). The benefits, challenges and implications for integrating emerging technologies in risk evaluation procedures for supply chains in transportation logistics. Discover Sustainability, 6(1), 476.

[5] Arismawan, Short, M., Mhdawi, A. M., et al. (2025). Humanitarian logistics supply chain management framework: A literature review. IOP Conference Series: Earth and Environmental Science, 1479(1), 012059.

[6] Song, X. (2025). Research on optimization of e-commerce supply chain logistics management model based on blockchain. The Frontiers of Society, Science and Technology, 7(3).

[7] Dutta, K. P., Bhattacharya, P., Verma, P. J., et al. (2025). Quantum computing and artificial intelligence in logistics and supply chain management. CRC Press.

[8] Zhuang, X. (2024). Digital analysis of logistics and supply chain management innovation of e-commerce enterprises in green economy. Applied Mathematics and Nonlinear Sciences, 9(1).

[9] Hou, D., & Zhou, M. (2024). Blockchain-based e-commerce supply chain logistics management model innovation in the context of big data analysis. Applied Mathematics and Nonlinear Sciences, 9(1).

[10] Zou, W., Guo, R., & Kao, L. (2024). Intelligent e-commerce logistics supply chain management and scheduling optimisation. Applied Mathematics and Nonlinear Sciences, 9(1).