Journal of Marketing & Social Research

ISSN (Online): 3008-0711

Volume: 02 | Issue 02 | Mar-Apr. | 2025
Journal homepage: https://jmsr-online.com/

Research Article

Key Drivers of Reverse Logistics in the Sustainable Apparel Supply Chain

Mr. B. Jai ganesh[1] and Dr. K.A. Guhaselvi[2]
[1]Research Scholar, G.R.Damodaran Academy of Management, Coimbatore, Tamil Nadu, India
[2]Principal, G.R.Damodaran Academy of Management, Coimbatore, Tamil Nadu, India

Submission: 11/03/2025; Received: 25/03/2025; Revision: 04/04/2025; Published: 30/04/2025

***Corresponding author:** Mr. B. Jai ganesh

Abstract: In the context of increasing environmental concerns and the growing demand for sustainable business practices, reverse logistics (RL) has emerged as a strategic tool within the apparel supply chain. This study explores the key drivers that influence the adoption and implementation of reverse logistics in the sustainable apparel sector, with particular attention to the Brazilian market. Through an extensive review of literature and industry practices, the research identifies five primary drivers—regulatory and legislative factors, strategic and economic considerations, operational and structural elements, environmental sustainability priorities, and technological innovations. The findings suggest that while compliance and cost-efficiency are significant motivators, the integration of advanced technologies and closed-loop supply chain models can further enhance the environmental and economic performance of apparel businesses. The study highlights the need for a holistic approach to reverse logistics, incorporating both environmental and social sustainability perspectives to foster a circular economy. The insights offered contribute to better decision-making among stakeholders aiming to align their operations with global sustainability goals.

Keywords: Reverse Logistics (RL), Sustainable Supply Chain, Apparel Industry, Circular Economy, E-commerce Returns

INTRODUCTION

The increasing global focus on sustainability has intensified the need for efficient reverse logistics (RL) practices, particularly in industries with significant environmental impacts, such as apparel. Reverse logistics, a crucial component of sustainable supply chain management, refers to the process of managing the flow of products, materials, and resources from the end consumer back to the manufacturer, distributor, or retailer. This process aims to recapture value, minimize waste, and reduce the environmental footprint of discarded products through returns, recycling, refurbishment, and resale.

In contrast to traditional logistics, which follows a linear path from suppliers to consumers, reverse logistics operates in the opposite direction, enabling businesses to enhance customer satisfaction while improving resource efficiency. Given the growing emphasis on circular economy principles, apparel brands are increasingly adopting sustainable reverse logistics strategies, including used apparel collection programs, remanufacturing, and material recovery. These initiatives not only contribute to waste reduction but also enhance brand reputation and regulatory compliance.

For e-commerce businesses, efficient reverse logistics is particularly critical, as consumer purchasing decisions are often influenced by return policies. Studies indicate that 67% of online shoppers review return policies before making a purchase, highlighting the strategic importance of RL in fostering customer trust and brand loyalty. Sustainable reverse logistics—sometimes referred to as the aftermarket supply chain—extends beyond returns management to encompass broader environmental and economic benefits.

This study aims to identify the key drivers influencing the development of reverse logistics in the sustainable apparel supply chain, with a specific focus on the Brazilian apparel industry. By evaluating the relative importance of these drivers, the research seeks to provide insights into the factors shaping RL adoption and implementation, ultimately contributing to the development of more sustainable business practices in the fashion sector.

DRIVERS OF REVERSE LOGISTICS IN THE SUSTAINABLE APPAREL SUPPLY CHAIN

Regulatory and Legislative Drivers

Regulatory bodies formulate policies to address societal and ecological concerns, but gaps in enforcement can hinder progress (de Oliveira et al., 2018). Strengthening global legislation and harmonizing Emission Trading Schemes (ETS) can drive effective environmental strategies, ensuring that businesses comply with sustainability requirements (Chaabane et al., 2012). The impact of take-back legislation on supply chain operations is a critical strategic issue for manufacturers, influencing how they design reverse logistics frameworks to comply with such mandates (Souza, 2013). The threat of legislation has led companies to improve their environmental and economic performance; however, proactive reverse logistics practices still show low adoption rates due to cost concerns and a lack of clear incentives (Laosirihongthong et al., 2013).

Strategic and Economic Considerations

Reverse logistics is primarily driven by economic and environmental trade-offs, necessitating the development of structured logistics networks that optimize cost and sustainability (Moritz Fleischmann et al., 1997; Moritz Fleischmann et al., 2000). Strategic factors influencing reverse logistics include cost efficiency, product quality, customer service, environmental concerns, and regulatory compliance, all of which play a critical role in determining how businesses integrate reverse logistics into their supply chain operations (Dowlatshahi, 2000). Green supply chain initiatives, including eco-design and reverse logistics, significantly impact environmental and cost outcomes, making sustainability a key consideration for firms (Eltayeb et al., 2011). In the context of sustainable apparel supply chains, reverse logistics must carefully balance cost-benefit analysis, transportation, warehousing, and remanufacturing to ensure economic viability while reducing environmental impact (Govindan et al., 2012).

OPERATIONAL AND STRUCTURAL ASPECTS

The design of reverse logistics networks plays a crucial role in ensuring the efficient flow of used goods from customers back to manufacturers for refurbishment, resale, or recycling (Savaskan et al., 2004; Ravi et al., 2005). The selection of service providers for reverse logistics support is a vital factor that determines the overall effectiveness of the system (Govindan et al., 2012). A well-integrated closed-loop supply chain combines both reverse and forward logistics processes, maximizing resource conservation and improving sustainability outcomes (V. Jayaraman et al., 1999). Decentralized collection channels, such as partnerships with retailers, enhance product return efficiency by providing convenient collection points for consumers (Savaskan & Van Wassenhove, 2006). Furthermore, analyzing barriers to reverse logistics through Interpretive Structural Modeling (ISM) helps identify and overcome critical obstacles that hinder effective implementation (Raci & Shankar, 2005).

Environmental and Sustainability Considerations

The evolving concept of green marketing underscores the importance of reverse logistics in sustainable supply chains, as businesses seek to enhance their environmental credentials (Dangelico & Vocalelli, 2017). Reverse logistics supports waste reduction, resource conservation, and compliance with environmental regulations, contributing to overall sustainability efforts (Nascimento et al., 2019). The environmental benefits of reclaiming, reusing, and recycling materials are gaining significance, yet the social sustainability aspects of reverse logistics remain underexplored in current research (Sarkis et al., 2010). Companies incorporating reverse logistics into their corporate sustainability strategies can reintegrate waste materials into their supply chains, reducing their ecological footprint and promoting circular economy principles (Nascimento et al., 2019). Additionally, Green Vehicle Routing Problems (GVRP) integrate reverse logistics with sustainability-focused transportation systems, optimizing logistics operations while minimizing emissions (Lin et al., 2014).

Technological and Innovation Aspects

Technological advancements are crucial in enhancing the efficiency of reverse logistics frameworks, particularly for managing End-of-Life (EOL) products, where financial and non-financial considerations must be integrated (Ravi et al., 2005). Emerging technologies, such as web-based platforms and blockchain systems, support circular economy practices by improving traceability and transparency in reverse logistics operations (Nascimento et al., 2019). Innovative product recovery networks are necessary for optimizing reverse logistics systems, ensuring that returned goods can be efficiently processed and reintegrated into supply chains (Mortiz Fleischmann et al., 2000). However, challenges remain in forecasting product returns and increasing adoption rates of reverse logistics solutions, necessitating further research and industry collaboration (Agrawal et al., 2015).

Table 1: Key Drivers and Corresponding References

Key Drivers	References
Regulatory and Legislative Drivers	de Oliveira et al. (2018); Chaabane et al. (2012); Souza (2013); Laosirihongthong et al. (2013)
Strategic and Economic Considerations	Moritz Fleischmann et al. (1997, 2000); Dowlatshahi (2000); Eltayeb et al. (2011); Govindan et al. (2012)
Operational and Structural Aspects	Savaskan et al. (2004); Ravi et al. (2005); Govindan et al. (2012); Jayaraman et al. (1999); Savaskan & Van Wassenhove (2006); Raci & Shankar (2005)
Environmental and Sustainability Considerations	Dangelico & Vocalelli (2017); Nascimento et al. (2019); Sarkis et al. (2010); Lin et al. (2014)
Technological and Innovation Aspects	Ravi et al. (2005); Nascimento et al. (2019); Mortiz Fleischmann et al. (2000); Agrawal et al. (2015)

CONCLUSION

Reverse logistics in the sustainable apparel supply chain is driven by a combination of regulatory, strategic, operational, environmental, and technological factors. While legislation and cost considerations significantly influence adoption, operational efficiency and sustainability concerns are equally critical. Future research should focus on enhancing technological integration and addressing social sustainability dimensions to create a holistic and effective reverse logistics framework.

REFERENCES:

1. Agrawal, S., Singh, R. K., & Murtaza, Q. (2015). A literature review and perspectives in reverse logistics. *Resources, Conservation and Recycling, 97*, 76–92. https://doi.org/10.1016/j.resconrec.2015.02.009
2. Bhandari, N., Garza-Reyes, J. A., Rocha-Lona, L., Kumar, A., Naz, F., & Joshi, R. (2022). Barriers to sustainable sourcing in the apparel and fashion luxury industry. *Sustainable Production and*

Consumption, *31*, 220–235. https://doi.org/10.1016/j.spc.2022.02.007

3. Bouzon, M., & Govindan, K. (2015). Reverse logistics as a sustainable supply chain practice for the fashion industry: An analysis of drivers and the brazilian case. In *Sustainable Fashion Supply Chain Management: From Sourcing to Retailing* (Vol. 1, pp. 85–104). Springer Nature. https://doi.org/10.1007/978-3-319-12703-3_5
4. Bouzon, M., Govindan, K., Rodriguez, C. M. T., & Campos, L. M. S. (2016). Identification and analysis of reverse logistics barriers using fuzzy Delphi method and AHP. *Resources, Conservation and Recycling*, *108*, 182–197. https://doi.org/10.1016/j.resconrec.2015.05.021
5. Chaabane, A., Ramudhin, A., & Paquet, M. (2012). Design of sustainable supply chains under the emission trading scheme. *International Journal of Production Economics*, *135*(1), 37–49. https://doi.org/10.1016/j.ijpe.2010.10.025
6. Dangelico, R. M., & Vocalelli, D. (2017). "Green Marketing": An analysis of definitions, strategy steps, and tools through a systematic review of the literature. *Journal of Cleaner Production*, *165*, 1263–1279. https://doi.org/10.1016/j.jclepro.2017.07.184
7. Daugherty, P. J., Richey, R. G., Genchev, S. E., & Chen, H. (2005). Reverse logistics: Superior performance through focused resource commitments to information technology. *Transportation Research Part E: Logistics and Transportation Review*, *41*(2), 77–92. https://doi.org/10.1016/j.tre.2004.04.002
8. de Oliveira, U. R., Espindola, L. S., da Silva, I. R., da Silva, I. N., & Rocha, H. M. (2018). A systematic literature review on green supply chain management: Research implications and future perspectives. *Journal of Cleaner Production*, *187*, 537–561. https://doi.org/10.1016/j.jclepro.2018.03.083
9. Diabat, A., & Govindan, K. (2011). An analysis of the drivers affecting the implementation of green supply chain management. *Resources, Conservation and Recycling*, *55*(6), 659–667. https://doi.org/10.1016/j.resconrec.2010.12.002
10. Dowlatshahi, S. (2000). Developing a theory of reverse logistics. *Interfaces*, *30*(3), 143–155. https://doi.org/10.1287/inte.30.3.143.11670
11. Eltayeb, T. K., Zailani, S., & Ramayah, T. (2011). Green supply chain initiatives among certified companies in Malaysia and environmental sustainability: Investigating the outcomes. *Resources, Conservation and Recycling*, *55*(5), 495–506. https://doi.org/10.1016/j.resconrec.2010.09.003
12. Fleischmann, Moritz, Bloemhof-Ruwaard, J. M., Dekker, R., Van Der Laan, E., Van Nunen, J. A. E. E., & Van Wassenhove, L. N. (1997). Quantitative models for reverse logistics: A review. *European Journal of Operational Research*, *103*(1), 1–17. https://doi.org/10.1016/S0377-2217(97)00230-0
13. Fleischmann, Mortiz, Krikke, H. R., Dekker, R., & Flapper, S. D. P. (2000). A characterisation of logistics networks for product recovery. *Omega*, *28*(6), 653–666. https://doi.org/10.1016/S0305-0483(00)00022-0
14. Govindan, K., Palaniappan, M., Zhu, Q., & Kannan, D. (2012). Analysis of third party reverse logistics provider using interpretive structural modeling. *International Journal of Production Economics*, *140*(1), 204–211. https://doi.org/10.1016/j.ijpe.2012.01.043
15. Hossan Chowdhury, M. M., & Quaddus, M. A. (2021). Supply chain sustainability practices and governance for mitigating sustainability risk and improving market performance: A dynamic capability perspective. *Journal of Cleaner Production*, *278*, 123521. https://doi.org/10.1016/j.jclepro.2020.123521
16. Ilgin, M. A., & Gupta, S. M. (2010). Environmentally conscious manufacturing and product recovery (ECMPRO): A review of the state of the art. *Journal of Environmental Management*, *91*(3), 563–591. https://doi.org/10.1016/j.jenvman.2009.09.037
17. Islam, M. S., Tseng, M. L., Karia, N., & Lee, C. H. (2018). Assessing green supply chain practices in Bangladesh using fuzzy importance and performance approach. *Resources, Conservation and Recycling*, *131*, 134–145. https://doi.org/10.1016/j.resconrec.2017.12.015
18. Jayaraman, V., Guide, V. D. R., & Srivastava, R. (1999). A closed-loop logistics model for remanufacturing. *Journal of the Operational Research Society*, *50*(5), 497–508. https://doi.org/10.1057/palgrave.jors.2600716
19. Jayaraman, Vaidyanathan, Patterson, R. A., & Rolland, E. (2003). The design of reverse distribution networks: Models and solution procedures. *European Journal of Operational Research*, *150*(1), 128–149. https://doi.org/10.1016/S0377-2217(02)00497-6
20. Jia, F., Yin, S., Chen, L., & Chen, X. (2020). The circular economy in the textile and apparel industry: A systematic literature review. *Journal of Cleaner Production*, *259*, 120728. https://doi.org/10.1016/j.jclepro.2020.120728
21. Köksal, D., Strähle, J., Müller, M., & Freise, M. (2017). Social sustainable supply chain management in the textile and apparel industry-a literature review. *Sustainability (Switzerland)*, *9*(1), 100. https://doi.org/10.3390/su9010100
22. Kozlowski, A., Searcy, C., & Bardecki, M. (2015). Corporate sustainability reporting in the apparel industry an analysis of indicators disclosed. *International Journal of Productivity and Performance Management*, *64*(3), 377–397. https://doi.org/10.1108/IJPPM-10-2014-0152
23. Laosirihongthong, T., Adebanjo, D., & Choon Tan, K. (2013). Green supply chain management practices and performance. *Industrial Management & Data Systems*, *113*(8), 1088–1109. https://doi.org/10.1108/IMDS-04-2013-

0164

24. Lin, C., Choy, K. L., Ho, G. T. S., Chung, S. H., & Lam, H. Y. (2014). Survey of Green Vehicle Routing Problem: Past and future trends. *Expert Systems with Applications*, *41*(4), 1118–1138. https://doi.org/10.1016/j.eswa.2013.07.107
25. Nascimento, D. L. M., Alencastro, V., Quelhas, O. L. G., Caiado, R. G. G., Garza-Reyes, J. A., Lona, L. R., & Tortorella, G. (2019). Exploring Industry 4.0 technologies to enable circular economy practices in a manufacturing context: A business model proposal. *Journal of Manufacturing Technology Management*, *30*(3), 607–627. https://doi.org/10.1108/JMTM-03-2018-0071
26. Prahinski, C., & Kocabasoglu, C. (2006). Empirical research opportunities in reverse supply chains. *Omega*, *34*(6), 519–532. https://doi.org/10.1016/j.omega.2005.01.003
27. Raci, V., & Shankar, R. (2005). Analysis of interactions among the barriers of reverse logistics. *Technological Forecasting and Social Change*, *72*(8), 1011–1029. https://doi.org/10.1016/j.techfore.2004.07.002
28. Raut, R. D., Luthra, S., Narkhede, B. E., Mangla, S. K., Gardas, B. B., & Priyadarshinee, P. (2019). Examining the performance oriented indicators for implementing green management practices in the Indian agro sector. *Journal of Cleaner Production*, *215*, 926–943. https://doi.org/10.1016/j.jclepro.2019.01.139
29. Ravi, V., Shankar, R., & Tiwari, M. K. (2005). Analyzing alternatives in reverse logistics for end-of-life computers: ANP and balanced scorecard approach. *Computers and Industrial Engineering*, *48*(2), 327–356. https://doi.org/10.1016/j.cie.2005.01.017
30. Sarkis, J., Helms, M. M., & Hervani, A. A. (2010). Reverse logistics and social sustainability. *Corporate Social Responsibility and Environmental Management*, *17*(6), 337–354. https://doi.org/10.1002/csr.220
31. Savaskan, R. C., Bhattacharya, S., & Van Wassenhove, L. N. (2004). Closed-Loop Supply Chain Models with Product Remanufacturing. *Management Science*, *50*(2), 239–252. https://doi.org/10.1287/mnsc.1030.0186
32. Savaskan, R. C., & Van Wassenhove, L. N. (2006). Reverse channel design: The case of competing retailers. *Management Science*, *52*(1), 1–14. https://doi.org/10.1287/mnsc.1050.0454
33. Shen, B., Li, Q., Dong, C., & Perry, P. (2017). Sustainability issues in textile and apparel supply chains. *Sustainability (Switzerland)*, *9*(9), 1592. https://doi.org/10.3390/su9091592
34. Shen, B., Zhu, C., Li, Q., & Wang, X. (2021). Green technology adoption in textiles and apparel supply chains with environmental taxes. *International Journal of Production Research*, *59*(14), 4157–4174. https://doi.org/10.1080/00207543.2020.1758354
35. Shih, L. H. (2001). Reverse logistics system planning for recycling electrical appliances and computers in Taiwan. *Resources, Conservation and Recycling*, *32*(1), 55–72. https://doi.org/10.1016/S0921-3449(00)00098-7
36. Souza, G. C. (2013). Closed-Loop Supply Chains: A Critical Review, and Future Research*. *Decision Sciences*, *44*(1), 7–38. https://doi.org/10.1111/j.1540-5915.2012.00394.x
37. Tibben-Lembke, R. S., & Rogers, D. S. (2002). Differences between forward and reverse logistics in a retail environment. *Supply Chain Management: An International Journal*, *7*(5), 271–282. https://doi.org/10.1108/13598540210447719
38. Van Hoek, R. I. (1999). From reversed logistics to green supply chains. *Supply Chain Management*, *4*(3), 129–134. https://doi.org/10.1108/13598549910279576
39. Vishwakarma, A., Dangayach, G. S., Meena, M. L., & Gupta, S. (2022). Analysing barriers of sustainable supply chain in apparel & textile sector: A hybrid ISM-MICMAC and DEMATEL approach. *Cleaner Logistics and Supply Chain*, *5*, 100073. https://doi.org/10.1016/j.clscn.2022.100073
40. Wilhelm, M., Blome, C., Wieck, E., & Xiao, C. Y. (2016). Implementing sustainability in multi-tier supply chains: Strategies and contingencies in managing sub-suppliers. *International Journal of Production Economics*, *182*, 196–212. https://doi.org/10.1016/j.ijpe.2016.08.006
41. Xu, M., Cui, Y., Hu, M., Xu, X., Zhang, Z., Liang, S., & Qu, S. (2019). Supply chain sustainability risk and assessment. *Journal of Cleaner Production*, *225*, 857–867. https://doi.org/10.1016/j.jclepro.2019.03.307