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Editorial

Building Resilience in Closed-Loop Supply Chains through Information-Sharing Mechanisms

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Abstract: In this paper we reflect on the role of information sharing on increasing the resilience of supply chains. Specifically, we highlight the lack of studies addressing this relevant topic in closed-loop supply chains. Then, we introduce the works covered by the Special Issue "Information Sharing on Sustainable and Resilient Supply Chains" to investigate the relationships between information sharing and resilience in sustainable supply chains.

Keywords: information sharing; resilience; sustainability; supply chain

1. A Brief Background of the Special Issue

It is well known that information sharing plays a key role in improving supply chain coordination. In this fashion, several authors have explored the value of sharing relevant information of supply chain stakeholders from multiple perspectives, including the reduction of inventory-related costs, the mitigation of the Bullwhip Effect phenomenon, and the reduction of overall lead times; for example, in [1–8]. In addition, information transparency has proven to be an effective means to increase the resilience of supply chains, as noted by [9,10]. This property, which refers to the ability of the supply chain to regain stability after facing severe disruptions, has become essential to making survival certain in the current, fast-changing business environment; see [11–13].

At the same time, several studies have provided evidence of some important barriers emerging in the implementation of collaborative solutions for supply chains based on sharing information among the partners. These barriers include mistrust between partners, misalignments in organizational compatibility, deficiencies in shared vision, and the high cost of information-sharing mechanisms in some practical contexts. Indeed, they may even lead the supply chain alliances to fail, as discussed in detail by [14], who identified sociological and structural resistors that reinforce each other to undermine collaborative behaviors, thus sometimes making it difficult to reach the potential benefits of information-sharing mechanisms.

Having highlighted the potential value of and risks associated with information sharing in supply chains, it may be relevant to note that most studies in this area focus on traditional archetypes of supply chains that consider a one-way movement of materials. However, modern economies are currently evolving from the traditional linear model, an "extract-make-use-dispose" approach, to circular models, which also incorporate the collection and restoring of used products —thus resulting in the so-called "closed-loop supply chain" [15–17]. These emerging models entail important environmental and economic opportunities, but also pose new challenges. Specifically, they raise additional layers of uncertainties, including those related to the variable nature of the quality and quantity of returns [18–21].

While the literature on such systems is now proliferating, many areas of operational research remain still underexplored in the closed-loop scenario, as highlighted by many recent analyses on the closed-loop supply chain arena, such as [22–24].

All in all, we believe that new research efforts should be oriented toward understanding the effective implementation of solutions based on information sharing for making closed-loop supply chains more efficient and resilient. From this perspective, we proposed this Special Issue of *Sustainability*, which we are now introducing.

2. Contents of the Special Issue

After a thorough review process of 14 submissions, we are happy to publish this Special Issue with six articles that, in our views and those of the expert reviewers, demonstrate important contributions to the field under study. We briefly describe their contributions below.

First, the paper "Evidence-Based Resilience Management for Supply Chain Sustainability: An Interpretive Structural Modelling Approach", identifies a set of key performance measures of resilience in supply chains by integrating the systematic literature review and the interpretive structural modelling approaches. In their study, they put special emphasis on the concept of sustainability. Interestingly, they consider four other types of influential power variables, namely, drivers, dependent, autonomous, and linkage, thus providing a valuable contribution to the understanding of resilience in sustainable supply chains.

Second, the article "The Role of Transparency in Humanitarian Logistics", proposes a methodology to minimize natural disaster risks through efficient and effective humanitarian logistics. Specifically, they address how the performance, efficiency, and effectiveness of humanitarian logistics can be improved by promoting information transparencies, using data from employees participating in relief operations in Pakistan that are analyzed via a covariance-based structure equation model. Their conclusions highlight the role of public trust in improving humanitarian logistics operations, and raise awareness of the need to carefully consider decisions related to the fair distribution of relief items.

The third work, entitled "Integrating Green Practices into Operational Performance: Evidence from Brazilian Manufacturers", uses information from 117 Brazilian manufacturers. This study explores in detail the link between green supply chain practices and operational performance. The results reveal the importance of crafting environmental strategies with supply chain partners. It is also interesting to note that this work suggests an innovative measure of balanced up-down environmental management practices between suppliers and customers.

Fourth, the work "Information Sharing with ICT in Production Systems and Operational Performance", explores ten hypotheses around five variables considering the integration of information and communication technologies (ICTs) in production systems—in particular, information exchange, operations management, production control, distribution activities, and operational benefits. In quantifying the relationship between these variables, the article allows supply chain decision makers to make better decisions when implementing ICTs.

Fifth, "Enterprise Resilience Assessment—A Quantitative Approach", focuses on the concept of resilience as a key capacity to ensure organizational survival. Through quantitative methods that include dynamic programming and attenuation formulae, this research work shows how selecting optimal preventive actions allows organizations to increase their resilience. They illustrate their approach by addressing a realistic problem in which the organization needs to analyze four potential production problems, demonstrating considerable reductions in the annual costs caused by disruptions.

Finally, the article "Understanding the Sustainable Usage Intention of Mobile Payment Technology in Korea: Cross-Countries Comparison of Chinese and Korean Users", employs a sample of 908 individuals to explore the sustainable growth of Korean mobile payment. To this aim, the authors consider a three-legged model, formed by the unified theory of acceptance and use of technology model, the information systems success model, and the task-technology fit model, which enables the

examination of the factors determining consumers' acceptance of mobile payment solutions, providing meaningful insights for technology suppliers.

List of Contributions

(1) Shin, N.; Park, S. Evidence-Based Resilience Management for Supply Chain Sustainability: An Interpretive Structural Modelling Approach. *Sustainability* **2019**, *11*, 484.
(2) Khan, M.; Lee, H.Y.; Bae, J.H. The Role of Transparency in Humanitarian Logistics. *Sustainability* **2019**, *11*, 2078.
(3) Santos, H.; Lannelongue, G.; Gonzalez-Benito, J. Integrating Green Practices into Operational Performance: Evidence from Brazilian Manufacturers. *Sustainability* **2019**, *11*, 2956.
(4) Pérez-López, R.J.; Olguín Tiznado, J.E.; Mojarro Magaña, M.; Camargo Wilson, C.; López Barreras, J.A.; García-Alcaraz, J.L. Information sharing with ICT in production systems and operational performance. *Sustainability* **2019**, *11*, 3640.
(5) Sanchis, R.; Poler, R. Enterprise Resilience Assessment—A Quantitative Approach. *Sustainability* **2019**, *11*, 4327.
(6) Lin, X.; Wu, R.; Lim, Y.T.; Han, J.; Chen, S.C. Understanding the Sustainable Usage Intention of Mobile Payment Technology in Korea: Cross-Countries Comparison of Chinese and Korean Users. *Sustainability* **2019**, *11*, 5532.

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References

1. Lee, H.L.; So, K.C.; Tang, C.S. The value of information sharing in a two-level supply chain. *Manag. Sci.* **2000**, *46*, 626–643. [CrossRef]
2. Zhao, X.; Xie, J.; Leung, J. The impact of forecasting model selection on the value of information sharing in a supply chain. *Eur. J. Oper. Res.* **2002**, *142*, 321–344. [CrossRef]
3. Fiala, P. Information sharing in supply chains. *Omega* **2005**, *33*, 419–423. [CrossRef]
4. Zhou, H.; Benton, W.C., Jr. Supply chain practice and information sharing. *J. Oper. Manag.* **2007**, *25*, 1348–1365. [CrossRef]
5. Cannella, S.; Ciancimino, E.; Framinan, J.M. Inventory policies and information sharing in multi-echelon supply chains. *Prod. Plan. Control* **2011**, *22*, 649–659. [CrossRef]
6. Wu, L.; Chuang, C.H.; Hsu, C.H. Information sharing and collaborative behaviors in enabling supply chain performance: A social exchange perspective. *Int. J. Prod. Econ.* **2014**, *148*, 122–132. [CrossRef]
7. Babai, M.Z.; Boylan, J.E.; Syntetos, A.A.; Ali, M.M. Reduction of the value of information sharing as demand becomes strongly auto-correlated. *Int. J. Prod. Econ.* **2016**, *181*, 130–135. [CrossRef]
8. Dominguez, R.; Cannella, S.; Barbosa-Póvoa, A.P.; Framinan, J.M. Information sharing in supply chains with heterogeneous retailers. *Omega* **2018**, *79*, 116–132. [CrossRef]
9. Scholten, K.; Schilder, S. The role of collaboration in supply chain resilience. *Supply Chain Manag. Int. J.* **2015**, *20*, 471–484. [CrossRef]
10. Jain, V.; Kumar, S.; Soni, U.; Chandra, C. Supply chain resilience: Model development and empirical analysis. *Int. J. Prod. Res.* **2017**, *55*, 6779–6800. [CrossRef]
11. Pettit, T.J.; Fiksel, J.; Croxton, K.L. Ensuring supply chain resilience: Development of a conceptual framework. *J. Bus. Logist.* **2010**, *31*, 1–21. [CrossRef]

12. Purvis, L.; Spall, S.; Naim, M.; Spiegler, V. Developing a resilient supply chain strategy during 'boom'and 'bust'. *Prod. Plan. Control* **2016**, *27*, 579–590.
13. Tukamuhabwa, B.R.; Stevenson, M.; Busby, J.; Zorzini, M. Supply chain resilience: Definition, review and theoretical foundations for further study. *Int. J. Prod. Res.* **2015**, *53*, 5592–5623. [CrossRef]
14. Fawcett, S.E.; McCarter, M.W.; Fawcett, A.M.; Webb, G.S.; Magnan, G.M. Why supply chain collaboration fails: The socio-structural view of resistance to relational strategies. *Supply Chain Manag. Int. J.* **2015**, *20*, 648–663. [CrossRef]
15. Guide, V.D.R., Jr.; Van Wassenhove, L.N. OR FORUM—The evolution of closed-loop supply chain research. *Oper. Res.* **2009**, *57*, 10–18. [CrossRef]
16. Souza, G.C. Closed-loop supply chains: A critical review, and future research. *Decis. Sci.* **2013**, *44*, 7–38. [CrossRef]
17. Schenkel, M.; Caniëls, M.C.; Krikke, H.; van der Laan, E. Understanding value creation in closed loop supply chains–Past findings and future directions. *J. Manuf. Syst.* **2015**, *37*, 729–745. [CrossRef]
18. Teunter, R.H.; Flapper, S.D.P. Optimal core acquisition and remanufacturing policies under uncertain core quality fractions. *Eur. J. Oper. Res.* **2011**, *210*, 241–248. [CrossRef]
19. Zeballos, L.J.; Gomes, M.I.; Barbosa-Povoa, A.P.; Novais, A.Q. Addressing the uncertain quality and quantity of returns in closed-loop supply chains. *Comput. Chem. Eng.* **2012**, *47*, 237–247. [CrossRef]
20. Dominguez, R.; Cannella, S.; Ponte, B.; Framinan, J.M. On the dynamics of closed-loop supply chains under remanufacturing lead time variability. *Omega* **2019**, 102106. [CrossRef]
21. Ponte, B.; Naim, M.M.; Syntetos, A.A. The value of regulating returns for enhancing the dynamic behaviour of hybrid manufacturing-remanufacturing systems. *Eur. J. Oper. Res.* **2019**, *278*, 629–645. [CrossRef]
22. Govindan, K.; Soleimani, H.; Kannan, D. Reverse logistics and closed-loop supply chain: A comprehensive review to explore the future. *Eur. J. Oper. Res.* **2015**, *240*, 603–626. [CrossRef]
23. Abbey, J.D.; Guide, V.D.R., Jr. A typology of remanufacturing in closed-loop supply chains. *Int. J. Prod. Res.* **2018**, *56*, 374–384. [CrossRef]
24. Goltsos, T.E.; Ponte, B.; Wang, S.; Liu, Y.; Naim, M.M.; Syntetos, A.A. The boomerang returns? Accounting for the impact of uncertainties on the dynamics of remanufacturing systems. *Int. J. Prod. Res.* **2018**, *24*, 1–34. [CrossRef]

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