

International Journal of Production Research

CALL FOR PAPERS

Special Issue on “Ripple Effect and Supply Chain Disruption Management”

Special Issue Guest-Editors:

Alexandre Dolgui (FR), Dmitry Ivanov (DE), Srinivas (Sri) Talluri (USA)*

* Managing Guest Editor

Research on supply chain (SC) disruption management has focused on both empirical and analytical methodologies in understanding and appeasing risk. Irrespective of the methodology utilized, majority of the work in this domain has concentrated on disruption impact on strategic/tactical/operational performance and stabilization/recovery policies. A significant number of disruption studies has analysed how one or more events ripple throughout the SC and impact performance thus placing increased emphasis on the *ripple effect in SC*. Some recent studies on the ripple effect and the related SC resilience issues can be found in the bibliography of this Call for Papers.

The ripple effect occurs when a disruption, rather than remaining localized or being contained to one part of the SC, cascades downstream and impacts the performance of the SC. This impact might include lower revenues, delivery delays, loss of market share and reputation, etc., which has adverse effects on the profitability of SC. This Special Issue intends to present recent developments on the ripple effect in the SC for larger audience. *Ripple effect* describes the impact of a disruption propagation on SC performance and disruption-based scope of changes in SC structural design and planning parameters. The Special Issue aims at delineating major features of the ripple effect and methodologies to mitigate the SC disruptions and recover. It focuses on studies that address the ripple effect and provide a comprehensive vision of the state of the art and perspectives. The methodologies comprise of mathematical optimization, simulation, game theory, control theoretic, data-driven analytics, network complexity, reliability theory research, and empirical research. Even though a variety of valuable insights have been developed in this area in recent years, new research avenues and ripple effect taxonomies need to be identified for the near future.

The Special Issue is expected to furnish fresh insights for SC management and engineering regarding the following questions:

- Under what circumstances does one failure cause other failures?
- Which structures of the SC are especially susceptible to the ripple effect?
- What are the typical ripple effect scenarios and what is the most efficient way to respond to them?

Given these reflections, multiple ways to apply quantitative analysis to ripple effect modelling arise. Several research gaps might be addressed by the ability to dynamically change parameters during experiments and to observe how these changes impact performance in real time, e.g. considering:

- disruption propagation in the SC;
- dynamic recovery policies;
- gradual capacity degradation and recovery;
- multiple performance impact dimensions including financial and operational performance.

This special issue of IJPR aims to collate and present recent research examinations in the field of SC ripple effect and resilience. The focus would be on *new* antecedents of SC ripple effect mitigation - human, machine, process, and information technology based - and their singular

and combined impact on flexibility outcomes. The methodology encompasses a multi-disciplinary operational perspective that includes different analytical methods as well as empirical studies.

This special issue of IJPR seeks to attract high-quality, high-impact research, state-of-the-art developments building upon the ripple effect in SCs. Submitted papers have to comply with the philosophy of the journal. Potential topics include but are not limited to:

- Network structures, ripple effect and resilience
- Efficiency and resilience: contradictory or complementary goals in ripple effect mitigation?
- Impact of digitalization, Big Data analytics, and additive manufacturing on SC ripple effect and resilience
- Sourcing strategies and ripple effect
- The interplay of flexibility and redundancy to ensure SC resilience and mitigate the ripple effect
- Quantification and measuring of the ripple effect
- Behavioral modelling of the ripple effect
- Dynamic analysis of the SC ripple effect (simulation, control theory)
- Network redundancy optimization
- Interplay of financial and operational techniques in the ripple effect analysis
- Ripple effect visualization and control
- Coordination and ripple effect
- Organizational theory and ripple effect
- Competition and ripple effect

The wider research community is invited to submit their latest results in the above or closely related areas. Strong, new, and insightful conceptual and applications oriented studies that add significantly to the existing body of knowledge are particularly solicited.

Refereeing process:

This is an open call but we would particularly welcome extended papers of those presented at the 9th IFAC Conference MIM 2019 that will take place on August 28-30, 2019 in Berlin, Germany. The conference serves as a forum for an international community of researchers, practitioners and vendors on all aspects of manufacturing modelling, management and control. These papers must make an additional contribution, they must cite the conference paper and explicitly state what the additional contribution is.

See www.mim2019.com for details of the conference.

Authors should submit their papers via <http://mc.manuscriptcentral.com/tprs> and select "Special Issue: **Ripple Effect and Supply Chain Disruption Management**" when asked to indicate the "Manuscript Type" in the submission process. It is recommended that any submitted paper does not exceed 6000 words.

Submitted papers must not have been previously published nor be currently under consideration for publication elsewhere. Refereeing and the selection of papers will be carried out according to the standards of the International Journal of Production Research.

Important Dates:

Deadline for submissions: December 31st 2019

Notification of acceptance: Summer 2020

Contact Managing Guest-Editor:

Prof. Dr. Dmitry Ivanov

Professor of Supply Chain Management
Berlin School of Economics and Law
Badensche Str. 50
10825 Berlin, Germany
Email: divanov@hwr-berlin.de

Bibliography

- Akkermans, H., van Wassenhove L.N. (2018). Supply chain tsunamis: Research on low probability high impact disruptions. *Journal of Supply Chain Management*, 54(1), 64-76.
- Dolgui, A., Ivanov, D., Sokolov, B. (2018) Ripple Effect in the Supply Chain: An Analysis and Recent Literature. *International Journal of Production Research*, 56(1-2), 414-430.
- Han, J., Shin, K.S. (2016) Evaluation mechanism for structural robustness of supply chain considering disruption propagation. *International Journal of Production Research* 54(1):135-151.
- Ho, W., T. Zheng, H. Yildiz & S. Talluri (2015) Supply chain risk management: a literature review. *International Journal of Production Research*, 53(16), 5031-5069.
- Ivanov D. (2017a) Simulation-based ripple effect modelling in the supply chain. *International Journal of Production Research*, 55(7), 2083-2101.
- Ivanov D. (2017b). Revealing interfaces of supply chain resilience and sustainability: a simulation study. *International Journal of Production Research*, DOI:10.1080/00207543.2017.1343507
- Ivanov D., Sokolov B., Dolgui A. (2014a). The Ripple effect in supply chains: trade-off 'efficiency-flexibility-resilience' in disruption management, *International Journal of Production Research*, 52(7), 2154-2172.
- Ivanov D., Sokolov, B., & Pavlov, A. (2014b). Optimal distribution (re)planning in a centralized multi-stage network under conditions of ripple effect and structure dynamics. *European Journal of Operational Research*, 237(2), 758-770.
- Ivanov, D. (2018). *Structural Dynamics and Resilience in Supply Chain Risk Management*. Springer, New York.
- Levner E., Ptuskin A. (2017). Entropy-based model for the ripple effect: managing environmental risks in supply chains. *International Journal of Production Research*, published online.
- Liberatore F, Scaparra M.P., Daskin M.S. (2012). Hedging against disruptions with ripple effects in location analysis. *Omega*, 40, 21-30
- Macdonald, J.R., Zobel, C.W., Melnyk, S.A., Griffis, S.E., (2018). Supply chain risk and resilience: theory building through structured experiments and simulation. *International Journal of Production Research*, DOI: 10.1080/00207543.2017.1421787
- Mizgier, K. J. (2017). Global Sensitivity Analysis and Aggregation of Risk in Multi-Product Supply Chain Networks. *International Journal of Production Research*, 55(1), 130-144.
- Pavlov A., Ivanov D., Dolgui A., Sokolov B. (2018) Hybrid fuzzy-probabilistic approach to supply chain resilience assessment. *IEEE Transactions on Engineering Management*, 65(2), 303-315.
- Scheibe K.P., Blackhurst, J. (2018) Supply chain disruption propagation: a systemic risk and normal accident theory perspective. *International Journal of Production Research* 56(1-2), 43-59.
- Schmitt T.G., Kumar S., Stecke K.E., Glover F.W., Ehlen M.A. (2017). Mitigating disruptions in a multi-echelon supply chain using adaptive ordering. *Omega*, 68, 185-198.
- Sokolov, B., D. Ivanov, A. Dolgui, A. Pavlov (2016). Structural quantification of the ripple effect in the supply chain. *International Journal of Production Research*, 54(1), 152-169.
- Yildiz, H., J. Yoon, S. Talluri, W. Ho (2016). Reliable Supply Chain Network Design, *Decision Sciences Journal*, 47(4), 661-698.
- Yoon, J., S. Talluri, H. Yildiz, W Ho (2018a). Models for Supplier Selection and Risk Mitigation: A Holistic Approach. *International Journal of Production Research*, 56(1-2).