Special Issue: Modeling and Optimization of Supply Chain Resilience to Pandemics and Long-Term Crises
IISE Transactions: Focused Issue on Scheduling and Logistics

This Special Issue is motivated by novel decision-making settings entailed in supply chain resilience in the wake of the COVID-19 pandemic and characterized by crisis-like environment, epistemic and deep uncertainty, and adaptability as a "new normal" instead of stability and long-term planning. Supply chain resilience research has been developed to manage disruptions which are considered events with an instant and full impact (e.g., earthquake) and followed by some recovery measures once the disruptive event is over to bounce back to "old normal" (e.g., using backup sourcing and some extra inventory pre-positioning). Usually, supply chain resilience modelling in this setting is based on disruption probability estimations (i.e., random or hazard uncertainty: known-known and known-unknown). Our Special Issue is looking at situations with long-term crises when recovery/adaptation should be planned and deployed in the presence of disruptions and bouncing back to "old normal" is impossible or difficult on a short-term scale, and the only way to survive is to adapt. This novel and underexplored setting is obviously motivated by the COVID-19 pandemic which unveiled new and understudied context which goes beyond a single-point-failure-and-bouncing-back understanding of supply chain resilience.

This novel context can be described as a supply chain crisis subject to the following characteristics:
- Long-lasting crisis with hardly predictable scaling and uncertainty about both short-term and long-term future in the supply chain and its environment, i.e., a deep uncertainty (unknown-unknown)
- Simultaneous disruptions in supply, demand, and logistics
- Recovery is performed in the presence of a disruption and its hardly predictable scaling (i.e., coupling of supply chain and disruption dynamics)
- Simultaneous and/or sequential openings and closures of suppliers, facilities and markets
- Response and recovery strategies taking potential crisis recurrence and setbacks into consideration
- Cascading effects of disruptions through the supply chain networks (i.e., the ripple effect).

We are seeking papers that fit into this novel context. We do not limit our Special Issue to the COVID-19 pandemic only and extrapolate the setting shown above to other possible supply chain crises that can happen in future and driven, e.g., by long-term political crises, global financial crises, recessions, and climate change. Creating relevant knowledge for these future challenges now is imperative and of vital importance. Under such settings, there is an obvious call to the research community for developing modeling and optimization techniques that account for such settings and guide firms in building adaptable, reconfigurable, resilient and viable supply chains. Topics of interests include, but are not limited to:
- modeling and optimization of supply chains under epistemic and deep uncertainty
- multi-objective optimization of network designs with consideration of efficiency, adaptability, resilience, and viability
- contingency planning for and reactive deployment of recovery under epistemic and deep uncertainty
- design and management of supply chains based on inherent adaptability and ability to change as a "normal," and not as a reaction to exceptional events.
- how to design and manage global supply chain networks given situational availability of some regions for production/logistics activities due to quarantines or severe and long natural disasters?
- how to utilize digital technology and data analytics to enhance supply chain resilience and viability?

For these research domains, we expect novel and innovative contributions with high practical relevance, ideally motivated by an industrial and healthcare context. We invite papers that explicitly incorporate specifics of epistemic and deep uncertainty and go beyond resilience to singular-event disruptions of some known probabilities.

Papers must be submitted through http://mc.manuscriptcentral.com/iietransactions and prepared according to the journal's Instructions for authors. Select "Special Issue" for the question "Please select the Focus Issue to which the paper is most related" at Step 1 in the submission process, and select the specific special issue at Step 6.

Important Dates
- Manuscript submission: 2/28/2022
- Completion of 1st round review: 5/31/2022
- Completion of 2nd round review: 10/31/2022
- Final manuscript submission: 12/31/2022
- Tentative publication date: 2/2023

Guest Editors

Professor David W. Coit (lead editor)
Rutgers University
coit@soe.rutgers.edu

Professor Dmitry Ivanov
Berlin School of Economics and Law
divanov@hwr-berlin.de

Professor Weiwei Chen
Rutgers University
wchen@business.rutgers.edu

Professor Nezih Altay
DePaul University
NALTAY@depaul.edu

Focus Issue Editor

Professor Phil Kaminsky
University of California at Berkeley
kaminsky@berkeley.edu