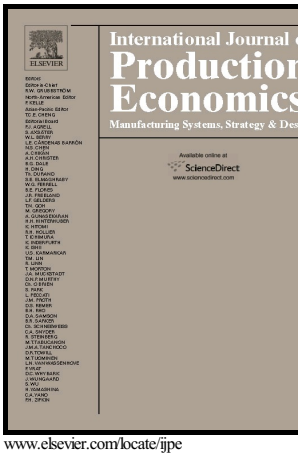

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Developing lean and responsive supply chains: A robust model for alternative risk mitigation strategies in supply chain designs

Faeghe Mohammaddust, Shabnam Rezapour, Reza Zanjirani Farahani, Mohammad Mofidfar, Alex Hill

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Author Information

Faeghe Mohammaddust (MSc)
Department of Industrial Engineering
Urmia University of Technology
Urmia
Iran

Shabnam Rezapour (PhD)
The School of Industrial and System Engineering
The University of Oklahoma
Norman
OK, USA

Reza Zanjirani Farahani (PhD) (corresponding author)
Department of Management
Kingston Business School
Kingston University, Kingston Hill
Kingston Upon Thames, Surrey KT2 7LB
The UK

Email: Zanjiranireza@gmail.com; R.ZanjiraniFarahani@kingston.ac.uk;
Tel : +44 (0)20 8417 5098
Fax : +44 (0)20 8417 7026

Mohammad Mofidfar (MSc)
Department of Macromolecular Science and Engineering
Case Western Reserve University
Cleveland
OH, USA

Alex Hill (PhD)
Department of Management
Kingston Business School
Kingston University, Kingston Hill
Kingston Upon Thames, Surrey KT2 7LB
The UK

ABSTRACT

This paper investigates how organization should design their supply chains (SCs) and use risk mitigation strategies to meet different performance objectives. To do this, we develop two mixed integer nonlinear (MINL) lean and responsive models for a four-tier SC to understand these four strategies: i) holding back-up emergency stocks at the DCs, ii) holding back-up emergency stock for transshipment to all DCs at a strategic DC (for risk pooling in the SC), iii) reserving excess capacity in the facilities, and iv) using other facilities in the SC's network to back-up the primary facilities. A new method for designing the network is developed which works based on the definition of path to cover all possible disturbances. To solve the two proposed MINL models, a linear regression approximation is suggested to linearize the models; this technique works