

# Supply chain disruption risk response strategies

## Abstract

Research in supply chain strategy has addressed generic strategies and operations risks. The emerging research in supply chain management is considering disruption risks. While Operational risks refers to the inherent uncertainties such as uncertain customer demand, uncertain supply, and uncertain cost, disruptions are typically characterized as low probability and high-impact events. Disruption risk events are the major disruptions caused by natural and man-made disasters such as earthquakes, floods, hurricanes, terrorist attacks, etc., or economic crises such as currency evaluation or strikes. Such events causing disruptions in supply chain lead to unsatisfied customers and hence significantly affect the ability of an organization to achieve financial success. Studies have shown that organizations are becoming more prone to disruptions due to increasingly complex and globalised supply chains. However, research on response strategies to address disruption risks is scant and this gap is well recognized in literature. Moreover there has been inconsistency in findings in this stream of literature which is found in practice as well. This study is an attempt at addressing these gaps by understanding the key factors that drives performance of response strategies against anticipated disruption risks.

Response strategies are particular combinations of supply chain re-design choices available for firms to become more resilient in the face of anticipated disruption risk events. One of the significant contributions of this study has been the development of a framework of the disruption risk response strategies. The response actions in this framework is drawn from the uncertainty management literature, operations risk literature, disruption risk literature and inputs from practitioners.

Operations management as a discipline has traditionally been following the best practice paradigm, the view that the adoption of best (world class) practice in a wide range of areas leads to better performance. An alternate theoretic lens has been the contingency theory lens which makes the assumption that in order to understand the effectiveness of various strategies, one must engage in an in-depth examination of all the contingencies or contextual conditions associated with the use of each strategy. Contingency theory is the theoretical framework employed for this study. The contextual variables employed in this study are supply chain strategy, product complexity and product life cycle. The fundamental thesis is that these variables have a contingent effect on the relationship between the various disruption risk response

strategies and performance of such strategies. Hypotheses were developed regarding the nature of this relationship.

Disruption risks can be threats or opportunities. While supply disruptions are threat events, spikes in demand are opportunity events. This study tries to understand how decisions on selection of response method would be influenced by the nature of disruption risk, i.e threat or opportunity. Prospect theory, the theoretical framework to understand the risk preference of decision makers in the face of uncertainty, is employed to understand the phenomenon. Hypothesis was developed regarding the nature of disruption risk and preference of response methods.

Supply chain risk management can be viewed as a strategic management activity in firms given that it can affect operational, market and financial performance of firms. Given the strategic nature of the decisions made in the context of disruption risks in supply chains, empirical methodology was adopted to test the framework. Administered survey method using a pre-structured questionnaire was used for data collection. The respondents were supply chain heads of large manufacturing firms in India. Fifty responses were elicited. The measurement items for each construct were pre-tested with practitioners for validity. Further factor validity was tested. Reliability was established in terms of Cronbach's alpha coefficient. The moderation effect of the contingent or contextual variables on the relation between response strategy and performance were tested using multiple regression method.

The results suggest support for hypotheses concerning the moderating effect of supply chain strategy, product complexity and the product life etc on the relationship between response strategy and performance. Results also support the hypothesized relationship between nature of disruption risk and response method selection.

One of the conclusions derived is that future attempts at studying supply chain strategies have to take into account not only the product-market characteristics but also the possible disruption risks as relevant independent variable. Though there are limitations in this study regarding sample size and the generic nature of the questions asked, this work highlights the need for further research to address the strategic question of cost effective risk mitigation response for anticipated supply chain disruption risks.