

Dual versus Triple Sourcing: Decision-making under the Risk of Supply Disruption

HODA DAVARZANI
UTS Business School, Management Discipline Group
University of Technology Sydney
Haymarket, NSW 2000
AUSTRALIA
hoda.davarzani@uts.edu.au

ANDREAS NORRMAN
Department of Industrial Management and Logistics
Lund University
Ole Römers väg 1, Box 118, SE-22100 Lund
SWEDEN
andreas.norrman@tlog.lth.se

Abstract: This paper studies three different strategies of sourcing. The whole process of this research including the problem definition is exactly based on a real case condition. This paper model sourcing process of required parts and material for a product which is manufactured under the license of Peugeot Company, the mother manufacturer in France. Based on the agreement between Peugeot and the manufacturer in Iran, all the parts should be supplied from a certified suppliers of the mother company. This paper investigates a single product setting in which a firm can source from multiple suppliers. One supplier has unreliable capacity but it is the first choice of supply because of being in partnership with Peugeot and the opportunity for future cooperation, while other suppliers are reliable but with lower product quality and not in direct relation with Peugeot. The addressed context, in which a case study has been made, is disruption due to sanctions which cause failure in the sourcing from the unreliable supplier. The main focus of current work is on defining the share of each supplier, and finding suitable sourcing policy (single, dual or triple sourcing) to apply for different probabilities of disruption. The paper is concludes in sensitivity analysis of different parameters such as set-up cost, and reveals their impact on final suggested strategy of sourcing.

Key-Words: supply chain disruption, dual-sourcing, triple-sourcing, supply disruption, sanctions, real case modeling.

1 Introduction

Regarding the complex and dynamic environment of supply chains, uncertainty (generally termed “risk”) has been raised as an important concern in literature. The reported dramatic outcomes from risky events demonstrate the importance of proactively managing supply chain risk [1].

Among the supply chain risks types are disruptions that result from natural disasters, labour disputes, supplier bankruptcy, acts of war and terrorism [2]. Naturally, different authors may suggest dissimilar sources for disruption risks, but disruption risks generally have a low probability and the potential for a large loss. Some papers refer to these as “catastrophic events” [3]. These risks can seriously disrupt or delay material, information and cash flows, any of which can damage sales, increase

costs or both. How a company fares against such threats depends on the type of disruption and the organization’s level of preparedness. Supply chains can take complementary actions to be prepared for such events [4]. They can secure their supply chain or develop resiliency to perform recovery plans immediately after disruption. Both can be performed in many different ways, and there is no single best solution. The problem for managers is to choose a good strategy and to quantify the benefits of various options.

Researchers addressed different mitigation [4-7] and contingency [8] strategies to reduce the impacts of disruptions. But the problem is lethal when a single source of the firm is disrupted and cannot continue its role anymore. So, in such situation the sourcing process is not disrupted for limited time

