



## Supply chain risk management in French companies

Olivier Lavastre <sup>a,\*</sup>, Angappa Gunasekaran <sup>b,1</sup>, Alain Spalanzani <sup>a,2</sup>

<sup>a</sup> Department of Supply Chain and Information Systems, University of Grenoble, 38 040 Grenoble – Cedex 09, France

<sup>b</sup> Department of Decision and Information Sciences, University of Massachusetts – Dartmouth, 285 Old Westport Road North Dartmouth, MA 02748-1778, USA

### ARTICLE INFO

Available online 22 November 2011

#### Keywords:

Supply chain risk management  
Empirical research  
Performance measures

### ABSTRACT

The risk thematic is not new in management, but it is a recent and growing subject in supply chain management. Supply Chain Risk Management (SCRM) plays a major role in successfully managing business processes in a proactive manner. Supply chain risk has multiple sources including process, control, demand, supply and environment. Supply chain management, faced with these risks, requires specific and adequate responses such as techniques, attitude and strategies for management of risk. This paper is based on an empirical study of 142 general managers and logistics and supply chain managers in 50 different French companies. It demonstrates that for organizations to be effective, SCRM must be a management function that is inter-organizational in nature and closely related to strategic and operational realities of the activity in question. Moreover, the findings of our empirical study suggest that effective SCRM is based on collaboration (collaborative meetings, timely and relevant information exchanges) and the establishment of joint and common transverse processes with industrial partners.

© 2011 Elsevier B.V. All rights reserved.

### 1. Introduction

In 2002, Christopher and Towill indicated that supply chain management was experiencing increasing exposure to risk [8]. Shortly thereafter, Blackhurst et al. [2] confirmed that firms were being confronted by increasing supply chain risks and Zsidisin et al. [66] underscored the dramatic consequences of negative events on companies. Market globalization, reduced product lifecycles, complex international networks of industrial partners, unpredictable demand, uncertain supply, cost pressures, the necessity to be lean and agile, increasing use of outsourcing and off-shoring, and reliance on suppliers make up some of the elements contributing to these difficult and ongoing situations [10,17,20,22,24,39,43,52].

Mitroff and Alpaslan [42] make an historic pronouncement concerning major crises. According to their analysis, the number of “normal” accidental crises, whether natural or man-made, is increasingly being overshadowed by abnormal or deliberately precipitated crises. Coleman [9] confirms this by stating that the frequency of man-made disasters increased exponentially during the 20th century in OECD countries. His analysis shows that this exponential growth in disaster frequency is largely due to an increase in traditional hazards such as fires and explosions, rather than from new technologies.

Elkins et al. [11] observe that this increase concerns both the potential for and magnitude of disruption. There is a limited number of DSS for supply chain risk management and one of them is by Li and Liao [33] and Tsai [55]. They developed DSS for dynamic alliance and cash flow risks in supply chain.

Supply chain risks are numerous and varied and many studies have tried to list them including those by Chopra and Sodhi [5]; Christopher and Peck [7]; Hallikas et al. [16]; Jüttner et al. [25] and Jüttner [24]. Studies concerning sources of supply chain risk are also numerous. For example, Harland et al. [17] focused on different classifications of risk types in their literature review spanning from 1996 to 2000. These risks concern different branches of management including (but not limited to) strategy, operations, supply, customer relations, asset impairment, competition, reputation, financial markets, fiscal and regulatory requirements, and legal.

Chopra and Sodhi [5] propose disruptions, delays, systems, forecasts, intellectual property, procurement, receivables, inventory, and capacity as the nine main sources of supply chain risk. Meanwhile Christopher and Peck [7] identify process, control, demand, supply, and environment as five risk sources. In 2003, Jüttner et al. [25] focused on environmental, network and organizational risk sources for supply chains. But some years later, Jüttner [24] noted two other sources of risk: supply and demand. Taking a slightly different angle, Kleindorfer and Saad [27] emphasize three sources that increase disruption risk: operational contingencies (including equipment malfunctions and systemic failures), natural hazards (earthquakes, hurricanes and storms), terrorism and political instability. Kiser and Cantrell [26] highlight internal risks (risks in manufacturing, business, planning and control, mitigation and contingency) and external risks (risks in demand, supply,

\* Corresponding author. Tel.: +33 6 22 79 08 63.

E-mail addresses: [olivier.lavastre@upmf-grenoble.fr](mailto:olivier.lavastre@upmf-grenoble.fr) (O. Lavastre), [agunasekaran@umassd.edu](mailto:agunasekaran@umassd.edu) (A. Gunasekaran), [alain.spalanzani@upmf-grenoble.fr](mailto:alain.spalanzani@upmf-grenoble.fr) (A. Spalanzani).

<sup>1</sup> Tel.: +1 508 999 9187.

<sup>2</sup> Tel.: +33 4 76 82 55 74.

environment, business and physical plant). And finally, Wagner and Bode [57] divide the sources into five distinct classes: demand side; supply side; regulatory, legal and bureaucratic; infrastructure, and catastrophic. Hua et al. [21] develop a multi-agent simulation model to study the impact of various operational parameters and decisions, such as horizontal competition among retailers, order allocation strategies of retailers, wholesale price of manufacturers, characteristics of market demand and number of retailers, on bankruptcy propagation.

Supply chain vulnerability can also be considered a risk factor and can be defined as “*exposure to serious disturbance arising from supply chain risks and affecting the supply chain’s ability to effectively serve the end customer market*” [37]. Extant literature has focused on identifying sources of uncertainty and the risk emanating from them. Several authors develop methodologies for risk identification and assessment [5]. Risk identification consists of quantifying risks and this information can then be used in deriving risk mitigation strategies [5].

As outlined above, SCRM is very important given the new economic and industrial environment in which firms currently work. The purpose of this present research is to contribute to and provide a more complete understanding of SCRM by studying three aspects of SCRM: attitudes toward risk, tools used to understand risk, and the ways in which decisions are made. We have formulated three general research questions for the study: (i) What are supply chain managers’ attitudes toward risk? (ii) What tools are used to manage risk? (iii) What managerial techniques are considered the most effective in minimizing supply chain risk, and most efficient in terms of supply chain risk management? In an attempt to answer to these questions, we employ an empirical methodology (questionnaire with closed questions) and statistical analysis. We will not try to identify or define different supply chain risks because many studies have already broached this daunting subject including Chopra and Sodhi [5], Tang and Tomlin [50] and Jüttner [24]. Other studies have addressed specific fields such as networks [14–16,44], agility [38], and inbound perspective [59]. Still others have dealt with domains such as fashion products and commodities [39], aerospace supply chains [47], the American chemical industry [27,28], the American automotive industry (using a qualitative methodology) [10], the aerospace industry in the UK [19], and the European automotive industry [58]. Only a limited number of research projects have focused on (i) the organizational structure of the SCRM in a firm, and (ii) ways to manage supply chain risk in a dyadic approach (with industrial partners). Therefore, our research is microeconomic in focus that is, at a firm level and not macroeconomic focus. Moreover, in our study we try to adopt a practitioner’s perspective, focusing on analysis of tools and attitudes adopted in a firm.

## 2. Research background

In this section, we try to provide a perspective on the evolution of SCRM based on a literature review of general SCRM issues. This includes a generic definition of risk, a definition of risk in supply chain management, risk management processes, differences between supply risk and supply chain risk and our definition of SCRM.

### 2.1. Generalities

Risk is present in numerous firm activities and having been studied from many perspectives including strategy, finance, production, accounting, and marketing, there are differences of opinion concerning its definition. Risk can also be studied from the Supply Chain Management (SCM) point of view. Lambert et al. [31] define SCM as “*the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders*”. These processes include not only traditional logistics activities such as warehousing, inventory management and inventory, and transportation, but also non-traditional activities such as procurement, production support, packaging, sales

management, and customer sales order processing [54]. In addition, SCM involves integration, coordination, cooperation and collaboration between organizations in the supply chain. That means, according to Gimenez and Ventura [13], that SCM requires integration of both internal (intra-organizational) and external (inter-organizational) elements.

### 2.2. General definition of risk

Yates and Stone [62] emphasize three elements to define a risk: the extent of loss (*elements of loss*), its importance (*significance of loss*) and its probability of appearance (*associated uncertainty of loss*). Following the work of Mitchell [41], Harland et al. [17] define risk as “*the probability of loss and the significance of that loss to the organization or individual*”. Mitchell uses the following formula to evaluate the risk of an event  $n$  from the probability of loss  $P(\text{loss}_n)$  and the importance of the loss  $L(\text{loss}_n)$ .

$$\text{Risk}_n = P(\text{loss}_n) * L(\text{loss}_n)$$

Kraljic [30] studies risk in the context of logistics/supply. He shows that risks exist because of procurement market complexity as characterized by the shortage of suppliers, replacement products and technology. Also bearing a degree of responsibility are entry barriers such as logistics costs, complexity and monopoly or oligopoly market conditions for suppliers.

### 2.3. Definition of risk in supply chain management

If we focus on the definition of risk in the field of supply chain management, it is possible to cite the work of March and Shapira [36] who define it as “*a variation in the distribution of possible supply chain outcomes, their likelihood, and their subjective values*”. According to this definition, a risk is a breakdown of flows between different components of the supply chain. This variability can potentially affect the flow of information, materials and/or products, and it may modify the use of human and equipment resources. In 1992, Sitkin and Pablo [48] defined risk as “*the extent to which there is uncertainty about whether potentially significant and/or disappointing outcomes of decisions will be realized*”. Zsidisin et al. [65] later defined supply risk as “*the transpiration of significant and/or disappointing failures with inbound goods and services*”. A few years later in a study on the aerospace industry, Zsidisin [63] offered the following definition: “*supply risk is defined as the probability of an incident associated with inbound supply from an individual supplier failure or the supply market occurring, in which its outcomes result in the inability of the purchasing firm to meet customer demand or causes threats to customer life and safety*”. This definition highlights an important criterion: the probability of risk occurrence. If risk is too strong, then it is no longer a risk but an event certain to happen. If the probability is too low, there is likely to be an unrealistic and unfounded fear that managers will not seek to manage the situation. This brings to the forefront the need to appropriately assess risk and develop processes to manage it.

For a list of operational risks, one can refer to Chopra and Sodhi [5], who identify nine risk categories: disruptions, delays, systems, forecast, intellectual property, procurement, receivables, inventory and capacity. Among the risks associated with supply chain, it is possible to include items such as delays in delivery of stock, machine breakdowns, delivered products that are not of the desired quality, use of information systems that create data integrity problems or systems becoming inoperative.

### 2.4. The risk management process

Some studies develop a risk management process that breaks down into four generic steps [16,17,63]. These steps are risk classification, risk identification, risk calculation, implementation/validation of risk management actions and sometimes risk monitoring. According to Zsidisin

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات