

# **The contribution of Purchasing/Supply Management to supply chain resilience: insights about an emerging market**

Andrea Lago da Silva

Ph.D., Associate Professor

Department of Industrial Engineering, Federal University of Sao Carlos, Brazil

Via Washington Luis, km.235, cp.676

CEP: 13565-905 São Carlos, SP, Brasil

deialago@ufscar.br

Wendy Lea Tate

Ph.D., Associate Professor

Department of Marketing and Supply Chain Management

Haslam College of Business

University of Tennessee

865-974-1648

Carla Roberta Pereira

PhD., Lecturer

Department of Administration, Pontifical Catholic University of Campinas, Brazil

Rod. Dom Pedro I, Km 136 - Parque das Universidades,

CEP: 13086-900, Campinas, SP, Brazil

## **Abstract**

This paper aims to investigate how the Purchasing/Supply Management function can contribute to supply chain resilience through organizational capabilities. To do so, a multiple case study was conducted in four different supply chains. Three capabilities were revealed as crucial to creating resilience in the supply chain: PSM structure, risk management and knowledge acquired.

**Keywords:** Supply Chain Resilience, Purchasing and Supply Management, Emergent Market

## **INTRODUCTION**

According to Ambulkar et al. (2015), managers are aware of the need to build organizational resilience in order to better manage supply impacts not only for their companies, but also for members working in the extensive and complex supply chains. Thus, building resilience into an organization requires efforts that are both internal to the organizations and external from the extended supply network. Purchasing/Supply Management (PSM) plays a critical role in this context by having the ability to solve conflicts and issues between internal

customers and external suppliers (Ellram and Birou, 1995), hence facilitating resilience. The purpose of this paper is to investigate how the PSM function can contribute to supply chain resilience through organizational capabilities. This research focuses on a buyer-supplier relationship of four multinational companies located in Brazil. An exploratory case-based research methodology was adopted using the four cases for data, each case comprising a focal company and two of its suppliers. The focus was specifically on PSM and upstream disruptions of manufacturers, located in the emerging Brazilian market. This research helps managers understand and develop the resilient capability to better cope with rapid and unexpected occurring events that severely affect ongoing supply chain management.

## **LITERATURE REVIEW**

### **Purchasing and Supply Management (PSM) as an organizational function**

Van Weele and Van Raaij (2014, p.57) affirm that PSM "is concerned with the management of external resources - goods, services, capabilities, and knowledge - that are necessary for running, maintaining, and managing the primary and support processes of a firm at the most favorable conditions." Considering this, PSM plays a fundamental role in companies all over the world by encompassing issues related to suppliers, transportation, incoming inspection, quality control and assurance (Monczka et al., 1998; Foerstl et al., 2013) through the process of planning, evaluating, implementing, and controlling highly important routine and sourcing decisions (Carr and Smeltzer, 1997; Sobhani et al., 2014). PSM also involves the determination of resource needs, supplier selection, price negotiation, contract specifications and delivery verification (Butter and Linse, 2008; Miemczyk et al., 2012).

To effectively manage the flow of organizational resources, as well as to orchestrate supply and demand, PSM activities must be attentive to events both internal and external to the organization (Ellram and Birou, 1995; Van Weele and Van Raaij, 2014). Internally, Szwejczewski et al. (2005) state that PSM managers are responsible for providing other functions with important information, such as the suppliers' capacity, logistics data, pricing and discounts and new product information. For this reason, there is an urgent need to develop the internal integration between PSM and other business functions for effective decision-making in the end (Chiang et al., 2012; Foerstl et al., 2013). Externally, PSM is significantly involved in the upstream supply chain, making processes more effective, efficient and sustainable (Schoenherr et al., 2012). Due to the direct relationship with the external part of the enterprise, PSM has a responsibility to mitigate risks and overcome problems that might arise from the environment or from the supply side (Chicksand et al., 2012) - knowing that suppliers have become more important for the competitive positioning of the company (Van Weele and Van Raaij, 2014).

### **Supply Chain Resilience**

From Latin origin (*resilire*), resilience means to leap back or to rebound. Thus, this concept can be explained as "the ability of an entity or a system to 'recover form and position elastically' following a disturbance or disruption of some kind" (Simmie and Martin, 2010, p.28). Ergo, the concept of resilience has also been applied to different subjects such as ecology, psychology, economy, social, and organisational approaches to demonstrate the capacity of any system to return to the equilibrium state after a temporary disturbance. Because of this overarching view, resilience has become a multidimensional and multidisciplinary phenomenon in the last forty years (Ponomarov and Holcomb, 2009; Pereira et al., 2014). The definition of supply chain resilience considered in this study is the capability of the supply chains to prepare

for unexpected events so as to be able to respond to and recover from them in a way to restore operations to the previous performance level or even to a new and better one. Because disruptions are becoming increasingly more severe, discovering ways to enhance resilient capability in the supply chain is a continuous and important requirement for organizations (Brandon-Jones et al., 2014; Fiksel et al., 2015).

Knowing that supply disruptions create severe resource variability across the entire supply chain, organizations must develop strategies to stabilize their operations through effective response and, as a result, introduce resilience as a survival capability. There is a remarkable increase in research which explores a variety of strategies to create organizational and supply chain resilience (*e.g.*; Scholten et al., 2014; Brandon-Jones et al., 2014; Ambulkar et al., 2015; Fiksel et al., 2015; Hohenstein et al., 2015), however there is still a lack of information concerning the complete understanding of how PSM can contribute to supply chain resilience.

## **RESEARCH METHOD**

Following Yin's (2009) recommendations to fulfill the criterion of reliability, a case study protocol was developed through the specification of all details and requirements of this study. Establishing the phenomenon of interest as the creation of supply chain resilience from a PSM perspective, a multiple case study design was carried out. The evidence from rigorous multiple cases are considered more compelling, with more robust results and a higher probability to create knowledge about the phenomenon of interest (Yin, 2009). Moreover, focusing on the research questions, the unit of analysis in this particular study is the PSM function within the focal company. Companies were selected based on defensible points shown in Table 1.

Semi-structured interviews were conducted with individuals from the focal companies, as well as from their corresponding key suppliers in order to obtain in-depth information from the field (Yin, 2009). To do so, three types of interview questionnaires were developed to assess the phenomenon of interest. The first questionnaire sought to check if a given company fits into the research's aims and also helps to identify key interviewees to provide relevant information for the study. The second focused on individuals from the PSM (or supply-related functions) and individuals from the particular focal company, while the third is for individuals from the selected key suppliers. Regarding the suppliers, individuals who are in direct contact with PSM employees were given priority. Secondary data were also collected from archival data provided by the suppliers and focal companies. Further information about the companies' history, their situation within the national and global market, as well as their products and customers were collected from their website or other sound websites. At the end, the interview questionnaires were assessed by knowledgeable people in the academy and validated after conducting the pilot test (Ellram, 1996; Yin, 2009).

Overall, 30 individuals from focal companies (PSM and other supply-related function individuals) and their corresponding key suppliers were interviewed. Eleven interviews were conducted face-to-face, while the rest were conducted by Skype. Deakin and Wakefield (2013) stated that although traditional face-to-face interviews remain prominent, they can be problematic due to time and financial constraints, as well as other logistical considerations. Generally, the interviews lasted an average 45 minutes each. All the interviews were recorded and transcribed for further analysis. Additionally, notes, impressions and ideas that occurred during the data collection were also documented and added to the case study database (Yin, 2009; Barratt et al., 2011).

Table 1. Criteria for the case selection

Criteria	Justification
Medium to large-size companies	Medium to large-size companies are naturally more complex in terms of capital. Considering this, it is expected that the practice of risk and disaster management is more developed in these types of companies rather than in small enterprises that hold less capital.
Manufacturing companies	They were mainly chosen to limit the scope of the study, besides considering that interesting cases of resilient solutions are related to product manufacturing (e.g. Christopher and Peck, 2004; Sheffi, 2001; Carvalho et al., 2012a; Brandon-Jones et al., 2014)
Well-developed PSM function	Considering this is the focal point of analysis in this study, it is required to select companies with PSM function which include two or more employees (managers and leaders); so that it is possible to triangulate opinions and generate results enhancing validity and reliability (Langley and Abdallah, 2012).
Companies from different sectors	The variety of sectors (beverage, household appliance, food, and agribusiness) provide a rich view from extreme situations, and it helps to clarify common issues among companies, as well as identify existent differences (Christopher et al., 2007). Four Brazilian multinational companies, including two key suppliers from each of the companies, were selected. Each of the multinational company is embedded in a different supply chain sector and critical suppliers were also chosen to participate.
Companies located in Brazil	After conducting an extensive systematic literature review, this study was especially considered in the Brazilian context due to the lack of studies concerning supply chain resilience in this particular country. Recognizing that Brazil is an emerging country, studies on this topic should be very helpful not only to help local practitioners to deal with any type of disruptions, but also for theoretical contribution.
Suppliers of critical items	The reason is to analyze the real consequences that unexpected breaks may cause to the focal company, and then investigate how PSM managers react to unexpected breaks and create resilience in the supply chains.

Empirical data were analysed qualitatively by means of a content analysis method (Bardin, 2008; Voss, 2008). To support this analysis, qualitative software called QDA Miner was used to codify the interviews (data fragmenting and re-assembling) in order to clarify the data related to the research questions and thus make the interpretation easier. Consequently, it made the data analysis process feasible to manage in a systematic and consistent manner (Sholten et al., 2014).

## RESULTS

Due to length constrains, the results will be restricted to the cross case analysis, which is briefly discussed in the following paragraphs. Each case includes one focal company and two of its suppliers. The cases are labeled as BEV, KAPPL, FOOD and AGRO.

### Cross-Case Discussion and Propositions

Figure 1 illustrates the three main capabilities (PSM Structure, Risk Management and Acquired Knowledge) related to PSM function that were found to be crucial to supply chain resilience. It is known that over time, managers increase their competences through lessons learned and past experiences from daily routines and practices. Thus, acquired knowledge and backup of this knowledge are built up through organizational practices or routines. Consequently, these routines carried out by PSM change various resources embedded in its routines/practices. Therefore, through integrating, adapting and reconfiguring internal and

external resources by changing ordinary routines/practices through manager's knowledge, PSM managers are able to build value-changing strategies to achieve supply chain resilience.

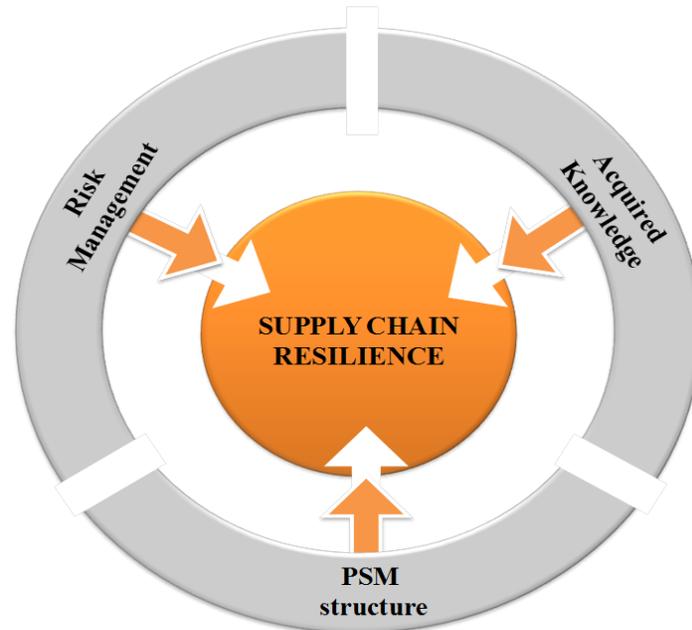


Figure 1- Three main organizational capabilities

### PSM structure

Wieland (2013) implies that a supply chain will become more resilient if it uses resources that enable it to cope with changes. Teece (2014) supports this affirmation by adding that only resources do not have much power in creating efficient actions. Yet they have to be dynamically and astutely combined. *"My job, among other things, is to coordinate things between the suppliers' approval and the franchises. To support the needs of the manufacturers, as well as the inputs, and ensure that the desired suppliers are up to our standards"* (interviewed BEV). Understanding the interactions among parts of the supply chain and their capabilities is important to enhance resilience in a system (Van der Vegt et al, 2015). Furthermore, synchronizing materials and information between the internal and external processes of the company, and efficiently taking actions to minimize the impact of any supply disruption is strategic for PSM.

The way the PSM function is structured within the focal company was found to be a relevant organizational capability to create resilience in the supply chain. Interviewees indicated the hierarchical structure as a significant barrier to efficiently share information and make faster decisions in times of supply disruptions. *"The great barrier I see is the organization hierarchy that sometimes slows down the decision making process. [...] we need to make decisions faster; perhaps if we had more responsibility, more autonomy"* (interviewed BEV). The procurement manager from AGRO (focal company) adds: *"a new supplier might take 6 months to be approved. If technical and regulation approvals are required, it might take 1 to 4 years"*. Furthermore, all cases follow the bow tie or basic buyer-supplier relationship (Christopher and Juttner, 2000). This kind of structure normally makes the supply decision very centralized to PSM function, which may reduce the flow of information sharing, collaboration, adaptive response, and consequently may also reduce the capability of being resilient. According to Van

der Vegt et al., (2015, p.973) "resilience of organizations not only depends on the availability and accessibility of resources, but also on the formal organizational structure" which could make better use of it. The following are proposed:

*P1. The hierarchical structure of the PSM function within the company may delay responses to supply disruptions, and consequently reduce the level of resilience in the supply chain.*

*P2. A high level of PSM autonomy helps to break the high level of bureaucracy, which may help to increase the level of response.*

*P3. Strengthening relationships between PSM with internal customers and with suppliers, as well as increasing autonomy of PSM, improves the risk management process.*

## **Knowledge acquired**

The learning process may be a central element in the creation and renewal of dynamic capabilities (Easterby-Smith and Prieto, 2008) as repetition and experimentation enable tasks to be performed better (Teece et al., 1997). All 30 interviewees from the 12 companies, with no exception, pointed out the great importance of knowledge acquired from past experiences to improve their abilities in coping with untoward events - "*Ah yes; look, in the past we've had problems of this nature [with suppliers]. So today, well not just today as we've been doing it for some time, our solution is to not have any kind of exclusivity with certain suppliers*" (interviewed BEV). It is through knowledge acquired that PSM managers enhance their capabilities of managing available resources to prepare, respond and recover their business from any critical disruption throughout the supply chain. As a result of the learning processes and knowledge accumulation, PSM managers can come up with great solutions to mitigate risk, as well as to overcome supply disruptions by knowing how to better build, integrate, adapt and reconfigure the organizational resources base through their routines and practices.

Although the importance of knowledge acquired to create supply chain resilience is clear to all interviewees, only two suppliers from the BEV and AGRO cases are used to recording lessons learned as a way to backup as much knowledge as possible. It is particularly interesting for coaches and trainers of new employees to be able to deal with daily function situations, as well as any unexpected events. Despite this lack of recording knowledge from their past experiences in the companies interviewed, no evidence was found which could reduce the capability of responding to and recovering disruptions in these supply chains. This fact may be supported by external knowledge that PSM individuals can acquire from suppliers or even their own knowledge from other work-related experiences. "*The acquired knowledge is not necessarily internal, right? So if I've worked on other cases of supply disruption in other companies, if you have any other external experiences from a different work culture, perhaps you'll have a different view of how to handle them. So, acquired knowledge: it makes a difference, yes*" (interviewed FOOD). The following are proposed:

*P4. Knowledge acquired from past experiences may qualify PSM individuals to better deal with supply risks and disruptions in the supply chain, even though they do not have the culture to record lessons learned.*

*P5. Acquiring knowledge helps PSM individuals to develop capabilities in managing the available resources in order to prepare, respond and recover their business from any critical breaks, and consequently build up resilience.*

*P6. Knowledge acquired from the suppliers may facilitate collaboration in responding to disruptions in the supply chain, which helps PSM to make better decisions to overcome disruptive situations.*

## **Risk management**

"The world is becoming turbulent faster than organizations are becoming resilient" (Hamel and Valikangas, 2003, p.2). Although this affirmation might be considered old, a recent study (July 2014), from the Global Supply Chain Institute at the University of Tennessee - Knoxville, has found that 90% of the organizations surveyed (150 supply chain executives and interviews with executives from six companies) do not measure supply chain risk when outsourcing production, and none of them use outside expertise to help assess supply chain risks (Dittman, 2015). It therefore brings to the forefront the importance of risk management in preparing companies to deal with disruptions through organizational resources and processes, which consequently leads to the creation of supply chain resilience. According to Van der Vegt et al. (2015), as resilience is the ability of systems to absorb and recover from shocks, this requires actively understanding the risks, what the strength resources are and how to best manage and reorganize them.

Many risk management practices and routines were identified from the multiple case studies (BEV, KAPPL, FOOD and AGRO) as an important activity of PSM - "*The PSM function is the main element in monitoring risk and avoiding supply disruptions*" (interviewed BEV). Among these practices/processes, it is interesting to observe that risk management may involve organization decisions.

*P7. PSM managers should pay attention to organizational capabilities (resources and processes - especially acquired knowledge and PSM structure) in the process of risk management so as to improve supply chain resilience.*

## **CONCLUSIONS**

This research has shown through the data analysis that PSM plays a significant role in creating supply chain resilience by managing and controlling the resource base. Harrison et al. (2013, p.265) asserted, "while resiliency resources, capabilities, and strategies could be powerful allies to mitigate disruptions, the question arises of how to effectively utilize them." Thus, this research sought to understand how PSM can contribute to supply chain resilience through organizational capabilities derived by resource configurations and management.

The focus was on resilience for Brazilian multi-national organizations considering the lack of their knowledge and preparedness in dealing with critical disruptions. In contrast to other countries that might face similar disruptive situations, Brazilian organizations are not used to the culture of preparing for and recovering from major disasters and damage (also observed in Bradashia and Pereira, 2015). The purpose of this research was, therefore, to shed light on creating a resilient culture using PSM actions to help cope with these kinds of disruptive situations in supply chains. As a result, PSM can help to enhance supply chain resilience by essentially managing and controlling three main organizational capabilities.

There are a number of theoretical implications arising from this research. Just to name a few, it is known that PSM is a critical business function capable of solving conflicts and issues among internal customers and external suppliers (Ellram and Birou, 1995), however it was found that the positioning of the PSM function within the company can enhance the creation of supply

chain resilience through effective communication and strong stakeholder relationships. Second, PSM managers are more prepared to manage and reconfigure organizational resources when there is a strong contact between suppliers and the PSM professional, as well as internal customers and PSM professionals. Therefore, creating a more decentralized decision-making PSM structure within the organization leads to resilient capabilities of responding to and recovering from disruptions.

From a managerial perspective, it is important to highlight troubles that might arise from the rigid hierarchy and the high level of bureaucracy, as well as the sparse contact and relationship with suppliers. These both may diminish the capacity of PSM to be responsive in making decisions. Another concern is how important the knowledge backup is to continuously improve the capacity of the managers to deal with events by retrieving past knowledge to create new and more effective solutions to the problems. Finally, creating resilience throughout the supply chain can be the result of how PSM professionals are able to effectively exchange information between internal and external parts of the company by managing risks and situations through knowledge acquired from lessons learned.

Observing such managerial implications, it is expected that practitioners are able to deal with unplanned outages without taking the risk of making immediate and inefficient decisions, which will affect the firm's performance. These capabilities will help PSM professionals to broaden and reaffirm their internal and external relationships by fulfilling their responsibilities of boundary spanning function. These organizational capabilities will therefore help managers to avoid mismatches in the long run.

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