HANDLING SUPPLY CHAIN DISRUPTIONS. GLOBAL VERSUS LOCAL FIRMS

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Abstract. *If you want to survive and remain competitive in the new business environment, you have to expand internationally. International expansion can increase profits and competitiveness, but it increases the company's risk exposure. Supply chain disruptions are an unpredictable and quite damaging category of risk. As global firms face a high range of risks than the local firms, the management of supply chain disruptions could not be the same. In many cases, global and local firms faced the same disruptions but only the global ones handled the disruption successfully. One of these cases was the aflatoxin disruption faced by Meggle and Primalat. On March 2013, the Kosovo Food and Veterinary Agency announced that two Albanian brands of milk contained two to three time higher levels of aflatoxin compared to the level allowed by the European Union. One of these brands was Fast, produced by Meggle, a global firm and the other brand was Primalat, an Albanian company. The laboratory analysis showed that the results were exaggerated, but the losses from this intentional disruption were huge. Primalat was not able to survive while Meggle handled the disruption successfully. The actual study will try to understand the factors that determine the success of global firms in handling supply chain disruptions, compared to local firms. To achieve this aim, semi structured interviews will be conducted with the managers of Meggle and Primalat. The cross comparative analysis will show that supply chain disruptions need special attention, no matter if the disruption is small or big. The success in handling supply chain disruptions depends on organizational culture and company background. Global firms can handle better disruptions due to their strong company background.*

Keywords: *supply chain disruption; Meggle; Primalat; intentional disruption; aflatoxin; company background; organizational culture*

Introduction

Today supply chains are more vulnerable, especially due to their tendency to be global. A global supply chain can be efficient in terms of cost but more exposed to risks than a local supply chain (Wagner & Bode, 2007). An important category of risk is supply chain disruption.

A few years ago, supply chain disruptions began to receive special attention, because companies now compete in global markets, where competition is tough, and to survive they have to be cost efficient. To reduce costs and increase efficiency, companies keep nearly zero inventories (Just in time inventory management) and try to find low-cost suppliers. All these in turn increase their exposure to disruptions. Also, the supply chains of many companies are becoming complex, difficult to be managed and more exposed to risks. Another reason, for this special attention to supply chain disruptions, is that the consequences of many recent disruptions, such as the terrorist attack or recent earthquakes, have been devastating (Revilla & Saenz, 2014).

Supply chain disruptions are becoming critical for many companies. A recent report (Business Continuity Institution, 2014) about supply chain disruptions reported that 81% of the companies, part of the study, had faced at least one supply chain disruption. The consequences of these disruptions were considerable, especially the non-financial consequences, which were long-term ones. For this reason supply chain disruptions need special attention.

As global supply chains face a high range of risks than the local supply chains, the management of supply chain disruptions could not be the same (Wagner & Bode, 2007). In many cases, global and local firms faced the same disruptions but only global firms handled the disruption successfully. This was the case of Meggle and Primalat.

Meggle is a global milk processing company, founded in 1987 in Germany. The vision of the company is the same from the foundation till now: Geared for expansion while also committed to tradition. Meggle's brand is related with quality, creativity, sustainability, innovation, long- term customer satisfaction and collaboration with the upstream and downstream part of the supply chain (MEGGLE AG, 2015). On August 2010, it decided to enter the Albanian market through the acquisition of a well-established Albanian company.

Primalat was an important Albanian milk processing company. The owners of the company had not only invested in the last technology but also in infrastructure, electricity and water network in the city where the company was located. 2000 farmers had long-term contracts with Primalat, which always tested the milk of the producers to assure that it was of a high quality. At the time before the aflatoxin scandal, the company recorded high sales in the Albanian market.

On 22 February 2013, the Kosovo Food Authority declared that the milk produced by Primalat and Meggle contained high levels of aflatoxin. The laboratory analysis showed that the results were exaggerated. However, the results were published too late, as Primalat declared the bankruptcy while Meggle turned in the market after two months. The analysis and comparision of the case studies will reveal the factors that determine the success of global firms in handling the supply chain disruptions compared to the local ones.

The structure of the article is the following: After the introduction section, there is a critical review of the relevant literature, continuing with the analysis of the case studies. It will be concluded with recommendations for managers and future research.

Literature review

"Supply chain disruptions are unplanned and unanticipated events that disrupt the normal flow of goods and materials within a supply chain and, as a consequence, expose firms within the supply chain to risks" (Craighead, Blackhurst, Handfield, & Rungtusanatham, 2007, p. 133).

Supply chain disruptions can occur in each part of the supply chain, inbound logistics, outbound logistics and the internal process. Inbound disruptions refer to supplier disruptions, which affect all the supply chain. Internal process disruptions involve directly the company. They include disruptions in the manufacturing plants and assembly plants if the company does not outsource the manufacturing and assembling phase. Outbound disruptions are related to demand and customers. They include massive decline in demand due to new technology, loss of customer confidence, competition and customer disruptions (Sheffi, 2007).

The sources of supply chain disruptions are infinite. The best way to understand them is by classifying into broader categories. Considering different publications regarding the sources of supply chain disruptions (Busch, 2011; Craighead et al., 2007; Hendricks, Singhal & Zhang, 2009; Juttner, Peck & Christopher, 2003: Revilla & Saenz, 2014; Schmitt, Kumar, Stecke, Glover & Ehlen, 2010; Sheffi, 2007; Steckea & Kumarb, 2009; Wagner & Bode, 2007), they can be classified in the following categories: natural disasters, accidents and intentional disruptions.

A natural disaster is defined as any event or force of nature that has catastrophic consequences (Sheffi, 2007). The natural disasters include earthquakes, flood, forest fire, hurricane, lightning, tornado, tsunami, volcanic, avalanche and many others. The natural disasters can affect any part of the supply chain from suppliers to the customers. In some locations natural disasters, like tornados or earthquakes, are frequent and different statistical models can be used to estimate the likelihood of their happening and the potential impact in the supply chain. But the experience has shown that many natural disasters are unexpected and with huge negative impacts in the global supply chains (Farole, 2011).

Accidents include unanticipated events such as quality accidents, labor accidents, fire, transportation accidents, communication accidents and many others. Some accidents have catastrophic effects, such as fire or quality problems, and some others have light effects in the supply chain. The best way to deal with them is prevention, by assessing the likelihood of the accident and the potential consequences. The company should design different scenarios for each type of accident that can happen and the best strategy to avoid them (Schmitt, Sun, Snyder, & Shen, 2015; Steckea & Kumarb, 2009).

Intentional disruptions are the ones that are caused by conscious acts by a person or a group. They can be classified in terrorist and non-terrorist. The last one includes labor strike, adverse media coverage, management manipulations, cyber attacks and many others. Many of these attacks take place at the worst time and at the worst place when the firm is more vulnerable and unprepared. The intentional disruptions are difficult to be predicted and so the best way to reduce their impact in the supply chain is to be always prepared (Steckea & Kumarb, 2009).

Supply chain disruptions can have serious negative economic impact, but even the non-economic impacts are devastating in many cases. Considering various publications (Bueno-Solano & Cedillo-Campos, 2014; Business Continuity Institution, 2014; Hendricks & Singhal, 2005; Sheffi, 2007) the economic consequences include loss of revenues, increase of costs, higher share price volatility and loss of productivity. The non-economic consequences include damage to brand reputation, increase regulatory scrutiny and difficulties in supply chain integration.

Strategies for handling supply chain disruptions

Regarding strategies for handling supply chain disruptions exist three different views in the literature. The first view is called supply chain risk management. It refers to the identification, analysis of risks as well as their control (Blome & Schoenherr, 2011; Giannakis & Louis, 2011; Li, Fan, Lee, & Cheng, 2015; Tang, 2006; Sheffi, 2007). According to them the best strategies for handling supply chain disruptions can be classified in:
- Robust strategies: A robust supply chain strategy is a strategy that helps the company to reduce costs and improve customer satisfaction under normal circumstances and also helps the company to manage the small disruptions and major disruptions by being both cost and time efficient (Tang, 2006). The author identified nine robust strategies: postponement, flexible supply base, strategic stock, make or buy, supply incentives, flexible transportation, revenue management, assortment planning and silent product rollover.
- Resiliency strategies: They help the company to increase the supply chain resilience, which do not merely imply the ability to manage risks but even the capability to do it better than the competitors by gaining competitive advantage (Sheffi, 2007). Their aim is to increase flexibility, redundancy and control.

The second view is called supply chain disruption management. It is a continuous process that analyzes the impact of disruptions and the best way to handle them (Revilla & Saenz, 2014; Xiao & Yu, 2005). Supply chain disruption management has not been studied by many authors compared to supply chain risk management. The work of Blackhurst, Craighead, Elkins and Handfield (2005), Sheffi (2007) and Revilla and Saenz (2014) has received the most attention in the literature regarding this topic.

According to Blackhurst et al. (2005) the company should follow three steps when the disruption happen. They are disruption discovery, disruption recovery, and supply chain redesign. It is important that after the firm turns back into normal conditions, it should redesign its supply chain, taking into consideration the lessons from the past disruption.

Sheffi (2007) argues that some companies can handle better disruptions compared to others because they have some cultural traits like the passion for work, continuous communication and distributed power. Understanding the relationships between them define the successful handling of supply chain disruptions. Revilla and Saenz (2014) concluded that the management of disruptions by global firms at the internal and inter-organizational level is universal. National differences have a week impact on supply chain disruption management.

The third view is called the integrative framework. It considers the two approaches together. By investing in supply chain risk management, many disruptions can be avoided. But due to cost and time many risks cannot be always predicted, so more attention must be paid to the response strategies. There have been some attempts to offer an integrative framework (Behdani, Adhitya, Lukszo & Srinivasan, 2012; Pyke & Tang, 2010) for handling disruptions. The authors did not consider supply chain risk management and supply chain disruption management separately but interconnected.

The gap identified in the literature, is that nearly no one has considered why the severity of a disruption is different for companies in the same industry, especially when one is a global company while the other is a local one. The actual research, based on a cross comparative case study analysis, will attempt to fill the existing gap in the literature, by identifing the factors that determine the success of global firms in handling the disruption compared to local ones.

Methodology

The research strategy is cross comparative by nature, and it relies on two case studies, respectively Meggle and Primalat case study. These companies were affected by the same intentional disruption, but only Meggle handled the disruption successfully. The data and information for the case studies were taken by the in-depth interviews conducted with the managers of the companies. The interviews were semi structured, due to the sensibility of the topic for the companies. The interview had three main parts. In the first part were required information about the past experiences of the companies in handling disruptions, information about organizational culture, organizational structure and information about all the supply chain partners and the level of supply chain collaboration. In the second part, the questions were related to the disruption (where, when and how it happened) and its first impact to the companies. In the third part, the interviewers were asked to describe in detail their reaction to the disruption and the final impact of the disruption. In this paper, there will be presented only the most relevant information.

Case studies analysis

This section will start with a description of the disruption, followed by a comparison of the companies' reaction to the disruption. It will be analyzed why the companies reacted in such way and the factors that determined the success in handling the disruption.

The aflatoxin scandal

On 22 February 2013, the Kosovo Food and Veterinary Agency announced that the milk produced by two Albanian milk processing companies, Primalat and Fast (produced by Meggle) contained two to three times higher levels of aflatoxin (the exact percentage was never declared) compared to the level allowed by the European Union.The media was immediately informed and these brands of milks were blocked in the Kosovo custom. The Ministry of Agriculture repeated the test in Tirana and also sent the samples for further verification in Brescia. The Italian laboratory testing showed that the level of the aflatoxin was not at very high levels (Habilaj, 2013). But what is aflatoxin and what are its effects in the human health?

Aflatoxins are toxic metabolites produced by certain fungi. It occurs mainly in crops if they are not stored in a dry place. If the animal consumes the contained crop a high level of aflatoxin will be noticed in milk, meat and other related products. Aflatoxin causes many negative effects in the human health, when the most fatal is liver cancer (Cornell University, 2014).

The continuous testing showed that aflatoxin came from the animal feed, especially the crop imported from Serbia. The milk produced by Meggle and Primalat was blocked in Kosovo. The companies withdrawed the milk even from the Albanian market. The production was stopped in the two factories. Primalat reported huge losses and was not able to survive to this disruption. Meggle Albania stopped the production for two months, but it returned strongly in the Albanian market later. Why Meggle Albania handled the intentional disruption successfully while Primalat did not?

Reaction to the disruption

Immediately after the notice was published in the media, the high managers of Meggle in Germany were called. They came in Albania the same day and brought with them the ELISA Test. This is a test used to measure the quantity of aflatoxin and other carcinogens substances in foods. The Ministry of Agriculture and the National Food Authority are the only ones that analyze the quantity of aflatoxin in agriculture food for all the Albanian producers. These two authorities had never asked before the milk processing companies to do this test.

Meggle did not only used the ELISA test for its milk, but also it helped the other milk processing companies, by testing their milk. The next day they brought the results of the test to the responsible authorities. However, the authorities did not accept to publish these results because they were waiting for the results of the Italian laboratory.

This long wait caused many losses to the firms. Firstly Kosovo followed a protectionism policy, by not allowing the milk produced by Meggle and Primalat in its territory, even if they showed the results of the test. Meggle and Primalat used to send nearly three trailers with milk every week in Kosovo.

At the moment of the disruption, Meggle had 400 ton of milk in inventory. The managers decided to sell it at half price. "We sold the milk at a price below costs, however the people were not buying it. The loyalty on our brand was very low. The public institutions were obliged by the Ministry of Agriculture to do not buy our milk. The financial losses were huge, nearly 1 million euros and the government didn't make anything to help us to recover"- said the plant manager of Meggle.

The owner of Primalat was shocked by this notice. His presence in media increased the week after the scandal. He always declared that the Kosovo Food Authority was doing this to help the national milk processing companies from the strong Albanian competition. Also, they blamed the Albanian institutions (National Food Authority and Ministry of Agriculture) for not doing anything to help the national companies. He decided to sell the milk at a low price but the sales were very low.

"It was like the devil was playing with us. The adverse media coverage for the aflatoxin scandal caused huge financial losses. I relied on a loan to build up this business. As the production was stopped, I was not able to pay the loan. I declared the bankruptcy"- said the owner of Primalat.

Meggle did not have financial difficulties as the mother company offered her help, especially the financial and managerial help. Even if the production was stopped for two months, the company did not fire the workers. It paid them regularly because it was sure that very soon it would turn in the market. Meggle has faced many disruptions before and one of the main element of its organizational culture is high uncertainty avoidance. Uncertainty is not tolerated, so they work a lot on the planning process and act quickly when problems happen, small or big being them.

Due to its company background and organizational culture, the company manifests a high degree of risk awareness. It has built up a specific risk department to deal with the unpredictable events. The

managers of this department made a careful analysis of the aflatoxin disruption. From the test, only a small quantity of milk in the market contained a high level of aflatoxin. The researches revealed that the crop used as a food for the cows contained a high level of aflatoxin. This crop was imported from Serbia and they have assured the quality of this product with the necessary certifications. All the animals of the milk suppliers were checked, in order to identify the level of aflatoxin present on their blood.

Primalat had not faced many disruptions, as it was a new local company. The level of risk awareness was low compared to Meggle. This can be noticed by the answer of one of the managers of Primalat - "We relied on proper planning and scenario analysis to deal with high probability disruptions, like demand fluctuations. Some disruptions, like the one we are talking, are very rare, and in many of the cases, they find the company unprepared. Having a special department for dealing with these types of disruptions is a costly and time-consuming option for local companies".

The organizational culture of Meggle manifests a high degree of collaboration. The company collaborates with all the supply chain partners especially with the suppliers, as they are the most critical part of the supply chain. "We strongly collaborate with suppliers. If a problem happens to them, we will offer our help. We are in together, in good and especially in bad times"- said the plant manager. The company did not abandon the suppliers which animals had high levels of aflatoxin in blood but gave to them Myfix, a medicinal that help to reduce the level of aflatoxin.

Primalat's organizational culture was more individualistic. "We prefer to have the best suppliers. If they do not meet our quality requirement, they could no longer be our supliers"- declared one of the managers of Primalat. The high degree of individualism is manifested even in the leadership style. No one in the company could undertake a certain action without the permission of the owner. When the disruption happened, the company did not organize a joint meeting with all the supply partners, to find the best solution for all. The suppliers of Primalat threw away tons of milk.

Conclusions

Although Meggle, a global company, and Primalat, a local company, were hit by the same intentional disruption, the first one recovered quickly from the disruption while the other went bankruptcy. This happened because Meggle reacted quickly, trying to find the source of the problem and then a strategy of recovery. The analysis of the case studies revealed that some factors can increase company resilience and also can help the company to recover quickly from the disruptions. These factors are:
- Company background: It refers to the company past experience in handling disruptions. Every company had faced at least one disruption. The disruptions small or big need special attention. After the recovery phase, each company should highlight the most important lessons from its experience in handling the disruption. Obviously, the company can face different types of disruptions, and there is no unique strategy to manage each of them. However, companies that have faced before disruptions, are more risk aware so they invest more in increasing company resilience. Moreover, these companies react quickly when the disruption happen and they did not under evaluate any possible sign that can bring to a serious problem. Global companies are more vulnerable to disruptions, so they have faced more disruptions compared to the local companies. Their past experience in handling disruptions can be a factor of success in dealing with future disruptions.
- Organizational culture: The analysis of the case studies has shown that cultures that manifest the following elements: uncertainty avoidance and collaboration can handle better disruptions. Companies that do not like uncertainty, try to increase the visibility over the supply chain. In this way, they can detect the weakest links in the supply chain quickly. Supply chain visibility can be increased through collaboration, but not every culture is collaborative. Some societies tend to work in group and to collaborate, while some other companies are more individualistic. The last one can increase supply chain visibility by relying on vertical integration. This is the solution followed by Primalat. It a costly and time-consuming option for global companies but maybe not for local ones.

Summarizing, companies that have faced before disruptions and have collaborative cultures, that manifest a high degree of uncertainty avoidance can handle better disruptions. These factors can help the company to increase the supply chain resilience. Also, they help the company to react and recover quickly from the disruptions. These results are compatible with the integrative framework (discussed in the literature review session). Disruptions must be prevented before happening. But some disruptions are unpredictable, so in this case the actions and strategies you implement, define the success in handling the disruption.

Disruptions are unpredictable and today supply chains are more vulnerable to disruptions. The lessons from the experience of Meggle and Primalat in handling the intentional disruption can be important for managers and researchers. You have to learn from others experience, in order to do not repeat their mistakes, as a wise person learns from other mistakes while a fool learns from his experience (Sheffi, 2007). The next section provides some recommendations for managers and future studies.

Recommendations for managers

Every company has to be prepared to face disruptions, as in this way it will reduce its vulnerability to disruptions. This is the first step for handling supply chain disruptions. To reduce supply chain vulnerability, companies should create a disruption catalog, which will categorize the disruptions based on their sources, likelihood of happening, consequences and so forth. After having identified and prioritized the disruptions, the company should work on reducing the probability of their happening and consequences. This can be achieved by increasing flexibility and supply chain security. All the people in the company have to be trained in handling disruptions, and emergency teams have to be created.

Companies have different organizational cultures, which sometimes help them to face disruptions and sometimes impose limits in handling disruptions. So it is suggested to understand who are the strengths and limits of the company's organizational culture. When managers will design strategies for handling supply chain disruptions, they have to consider these strengths and limits as the last ones will determine the success of the strategy execution.

Being prepared is the first step for handling disruptions. But what managers can do when the disruption happens? Firstly, they have to work as a team for identifying the source and the best way for handling the disruption. The companies should react quickly as there is no time to lose. Supply chain disruption in many of the times did not happen to the focal company but to the supply chain partners. The actions and strategies of each partner should be coordinated and the decision-making process should involve all of them. This in turn will help the companies to recover quickly, and the collaboration efforts will be increased in the future.

The disruption happened, the company reacted and everything turned back into normality. However, the process of supply chain disruption management should not stop here. The managers should ask: What can be learned from this experience?

Recommendations for future research

This study is focused only on two case studies. Maybe future research should be focused on other case studies and especially in other industries, to verify if the conclusions of this study hold even in other industries.Future researches could analyze also other type of disruptions, for example cases of outbound disruptions.

The role of the government is to help their domestic businesses. When a disruption happens, especially disruptions like the ones discussed in this paper, the responsible institutions should react quickly and stop the spread of panic. Future studies should consider the role of government in the supply chain disruption management process.

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