SCITECH
RESEARCH ORGANISATION|
Volume 2, Issue 1
February, 2016|
Journal of Marketing and HR
www.scitecresearch.com

The management of supply chain disruptionsin the Albanian milk processing industry

Denisa Mamillo
denisa.mamillo@uet.edu.al
Department of Management and Marketing
European University of Tirana, Tirana, Albania

Abstract

As for as long have been supply chains, there have been disruptions. But only a few years ago supply chain disruptions begun to receive special attention due the increasing vulnerability of the modern supply chains. For many companies, it is of vital importance to handle supply chain disruptions. They have established different robust supply chain strategies to overcome supply chain disruptions like postponement, strategic stock, flexible supply base and many others. This research is focused in the Albanian milk processing industry and its aim is twofold: first, to understand the main sources and consequences of supply chain disruptions and second, to analyze the strategies used by the companies to handle the disruption. Semi-structured interviews were conducted with the managers of the main milk processing companies. A guide questionnaire was prepared. The questionnaire had two main parts. The aim of the first part was to identify the sources and consequences of supply chain disruptions while the aim of the second part was to identify the strategies used by the companies to handle the disruptions occurred. The research will show that the best strategy for handling supply chain disruptions is a combination of resilience and robust strategies. The first step for handling successfully supply chain disruptions is being prepared, by increasing the resilience of the supply chains. Being prepared, it is always necessary but it might not be enough. The strategies and actions implemented by the companies after the disruption occurred, define their success in handling the supply chain disruption.

Key words: supply chain disruptions; robust strategies; Albanian milk processing industry

1. Introduction

1.1 Research rationale

As far as long have been supply chains, there have been disruptions. But only a few years ago supply chain disruptions begun to receive special attention. The main reason was the recent disruptive events, such as the terrorist attacks, the earthquake and tsunami in Japan and lastly the global crisis, which had caused devastating losses to global companies.

A second reason is the vulnerability of the modern supply chains. They have always been vulnerable but today they are more vulnerable, as the firms are less vertically integrated, and their supply chain is located all over the world. For many companies it is convenient to locate their main activities where it cost less, but they do not consider problems such as longer lead-times due to long routes of transportation, reliance on critical infrastructures (ports, communication systems), taxes, duties, fluctuations of exchange rates and especially government regulations. A global supply chain can be efficient in term of costs, but it is more exposed to a high range of risks rather than a local supply chain (Wagner & Bode, 2007).

The technology is also increasing the vulnerability of the modern supply chains. The technology changes quickly, and companies need to be innovative, to introduce in the market new products. To achieve this, companies rely on global sourcing, on lean manufacturing and on just in time inventory management. In this way, they are more exposed to supply chain disruptions.

Supply chain disruptions can occur in each part of the supply chain, inbound logistics, outbound logistics and the internal process. They can have different sources from natural disasters to intentional disruptions (Sheffi, 2007).But all the disruptions have devastating effects and need special attention.

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 considered had faced at least one supply chain disruption. It is really worth studying supply chain disruptions and strategies to mitigate them.

1.2 Albanian milk processing industry

The milk processing industry is one of the most important industries in the agricultural sector. The contribution of this sector to the GDP of Albania is 20%, the highest compared to other sectors (Instat, 2015).

There are many milk processing companies in Albania, nearly 400 that are registered, but only nine of them have gained the most significant part of the market. These nine companies have invested heavily in technology and operate with a daily capacity of 10-40 ton of milk (Instat, 2015).They have a specified laboratory to test the products and strict rules of hygiene. The remaining companies use traditional technology and due to financial difficulties cannot compete with the big nines. They are vertically integrated while the big ones have a supply chain spread all over the Balkan region, so they are more vulnerable to disruptions.

The milk processing industry had faced many disruptions in the last five years. The most catastrophic one was the aflatoxin scandal. In 2013, the Kosovo Food and Veterinary Agency gave the alarm that there were two Albanian brands of milk with a high level of aflatoxin. These two companies suffered huge financial losses and also problems with brand reputation. One of them was not able to handle the disruption, and went bankrupt. Other disruptions were the animal disease “blue tongue”, the river floods in South Albania and many others.

For the reasons mentioned above, I decided to do this research in the Albanian milk processing industry and more in specific on the biggest companies operating in this industry.

1.3 Research aim and proposition

The aim of the research is twofold: first, to understand the main sources and consequences of supply chain disruptions and second, to analyze the strategies used by companies to handle the disruption. The research is focused on the Albanian

milk processing industry, and more in specific on the biggest Albanian milk processing companies, for the reasons cited above.

This research will try to verify the following proposition: The best strategy to handle supply chain disruptions is a combination of resilience and implementation of robust strategies after the occurrence of the disruption.

The outline of the paper is the following: after the introduction section, the relevant literature review regarding supply chain disruptions and strategies to handle them will be analyzed. Then I will explain the methodology used. After the methodology section, I will discuss the findings, and I will conclude with limits of the study and recommendations for managers and future research.

2. Literature review

2.1 Some definitions

Firstly, I will provide the definition of supply chain and supply chain disruption that will be used in this paper.

"The supply chain - a term increasingly used by logistics professionals - encompasses every effort involved in producing and delivering a final product, from the suppliers to the customers" (Council of Supply Chain,2015).

“Supply chain disruptions are unplanned and unanticipated events that disrupt the normal flow of goods and materials within a supply chainand, as a consequence, expose firms within the supply chain to risks”(Craighead, Blackhurst, Handfield , & Rungtusanatham, 2007:132)

2.2 Supply chain disruptions

Today, supply chains are more vulnerable and more exposed to disruptions. 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. Many companies do not suffer only the consequences of their direct supplier’s disruptions, but also the consequences of indirect supplier’s disruptions. 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 disruption (Sheffi, 2007).

2.3 Sources and consequences of supply chain disruptions

The sources of supply chain disruptions are infinite. The best way to understand them is by classifying them in broader categories. Considering different publications regarding the sources of supply chain disruptions (Wagner & Bode, 2007; Sheffi, 2007; Craighead, Blackhurst, Handfield , & Rungtusanatham, 2007; Juttner, Peck, & Christopher, 2007; Revilla & Saenz, 2014) they can be classified in the following categories: natural disasters, accidents, and intentional disruptions.

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 etc.The natural disasters can affect any part of the supply chain from suppliers to the customers. Many of the natural disasters are frequent, like tornados or earthquakes, and different statistical models can be used to estimate the likelihood of their happening and the potential impact on 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 & Oliver, 2011).

With accidents, it is intended unanticipated and unforeseen events that disrupt the supply chain, such as quality accidents, labor accidents, fire, transportation accidents, communication accidentsand others(Sheffi, 2007).Some accidents have catastrophic effects, such as fire or quality problems, and some others have moderate effects on the supply chain. The best way to deal with them is prevention, by assessing the likelihood of the accident and the potential disruption.

Intentional disruptions constitute adaptable threats in which the perpetrators seek both to ensure the success of the attack and to maximize the damage .Many of these attacks take place at the worst time and at the worst place- when the firm is more vulnerable and unprepared. Examples of intentional disruptions are labor strikes (the most frequent), cyber-attack, intentional accidents and terrorism as the ultimate form of intentional. 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.

Different publications (Wagner & Bode, 2007; Business Continuity Institution, 2014; Craighead, Blackhurst, Handfield, & Rungtusanatham, 2007; Farole & Oliver, 2011) concluded that supply chain disruptions do not have only devastating financial effects but even non-financial effects such as brand reputation, shareholders concerns and so on. The financial consequences in many of the cases have short term impact while the non-financial effects have long- term impact.

2.4 Managing supply chain disruptions

After the terrorist attack on September 2001, the issue of supply chain security had gained significant importance. The aim of many studies was to increase the resilience of supply chains. Everything was focused on the warning stage. The companies should be prepared and supply chain risk management should be a specific department inside the company. Words such as flexibility, aligned and agile supply chains, multiple and reliable suppliers, continuous risk management and resilience were the words most used when supply chain disruption was mentioned (Hendricks & Singhal, 2005;Sheffi, 2007;Vakhary & Yenipazarli, 2009; Farole & Oliver, 2011). As, it is defined in the paper, the supply chain disruptions are unplanned and unanticipated events. Forecasting their happening is good, but forecasts are never 100% certain. The disruption will happen and the company should be able to react quickly. Not only is the warning stage important but even the recovery preparation stage. The first stage prepares the company to face the disruption while the second one enables the company to recover quickly after the disruption occurred.

But if the disruption happened and you are unprepared? Tang (2006) suggests using the robust strategies for mitigating supply chain disruptions. Robust strategies are the ones that work well in normal times and enable the company to recover quickly after the disruption occurred. They are:

- Postponement: The products share the same components and process initially and differ only in the last phase of production.
- Strategic stock: Keep a small inventory of bottleneck and strategic products.
- Flexible supply base: Having more than one supplier for each component.
- Make and buy: Produce inside the critical products and outsource the non-critical and low- value products
- Supply incentives: Try to build strong relationships with suppliers, by offering them incentives.
- Flexible transportation: Rely on different means of transportation.

- Revenue management: This strategy is used to meet uncertain demand when supply is limited. By reducing the price or promoting the products that are widely available, the customers will buy the available products rather that the ones that are not available.
- Assortment planning: Plan the assortment of their shops in order to entice customers to purchase the products that are available rather that the ones that are not available.
- Silent product rollover: New products are introduced slowly without formal announcement. This encourages customers to choose the products that are available instead of the new products.

Summarizing the literature argue that today supply chains are more exposed to disruptions. The best way to deal with them is building the resilient company, meaning being prepared. In the case, when the disruption finds the company unprepared, robust strategies are the best one to mitigate supply chain disruptions. Let's analyze if this hold for the Albanian milk processing companies.

3. Methodology

From the main nine milk processing companies, only seven become part of this study. The managers of one company didn't accept to provide information for the topic of this research, while I was not able to conduct the interview with the other company as it faced a disruption (river floods).

I conducted semi-structured interviews with the managers of these companies. The persons interviewed were plant managers, purchasing managers and in some cases the owner of the business. All interviews were conducted face to face, and the confidentiality of data was promised. A guide questionnaire was prepared to support the semi-structured interviews. It had two main parts. The aim of the first part was to identify the sources and consequences of supply chain disruptions. Many of the questions for the first part were taken by the questionnaire that the Business Continuity Institute uses every year to identify the sources and consequences of supply chain disruptions all over the world. The aim of the second part was to identify the strategies that companies use to handle supply chain disruptions. The questions will be mentioned, in the research findings section.

The guide questionnaire was first evaluated by academicians and was tested in one of the companies' part of the study. Some questions were improved and changed based on the feedback of the academicians and the result of the first interview.

The most relevant ethical issues for this research were: confidentiality of data, avoiding causing harm and lacking respect, informed consent and promise to provide the participant with a copy of the study.

4. Research findings

4.1 First part

In the section, I will analyze the answers of the most important questions of part one while in the next section I will analyze the answers of part two.

Question one: How many supply chain disruptions have faced your company in the last five years? All the milk processing companies faced at least one disruption. 55 % reported at least 11 disruptions, 28 % reported more than 51 disruptions while the others faced at least 20 disruptions on the supply chain in the last five years.

Question two: What were the major sources of disruption on the supply chain? Energy scarcity was the main source of disruption for all the companies. The price of energy had increased a lot the last years and there was no continuous energy power supply. 86 % declared that many of their clients were not able to pay for the products, and this brought financial difficulties to the companies. Five of them had a common client, which have not paid them for more than one year. The judiciary solution is costly and time -consuming. 43 % declared that disruptions were caused by transportation problems, due to a lack of good road infrastructure in Albania. Two companies declared that the adverse media coverage, especially for the aflatoxin scandal, was the major source of disruption for them. The other sources are presented in Figure 1.

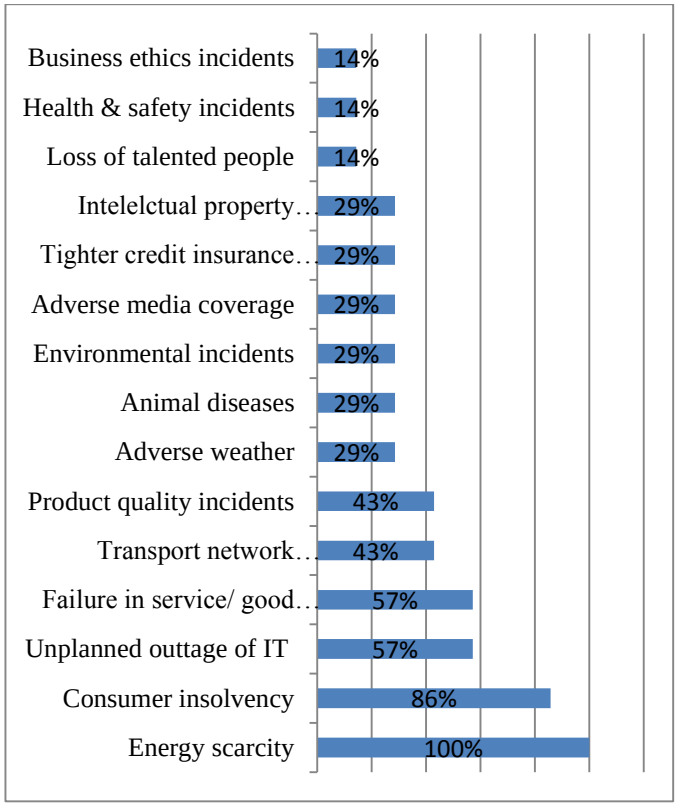

Figure.1: Major sources of disruption on the supply chain

Question three: Where did the problem originate? 71 % declared that the disruptions happened to the first tier supplier, 43 % declared that the disruption happened at the customer level. The others declared that the problem originated at the second and third tier supplier. These results show that the companies have analyzed carefully the disruption, to identify its origin.

Question five: What were the consequences of the disruptions faced in the last five years? The major consequences of the disruptions were fine by the regulator and increase in regulatory scrutiny. One of them said: “We faced a disruption and were near bankruptcy. The government instead of helping us to survive made the things more difficult”. In the last years, the taxes have been increased and the prices of product controls/tests have been doubled. The consequences were financial and nonfinancial. They are presented in Figure 2.

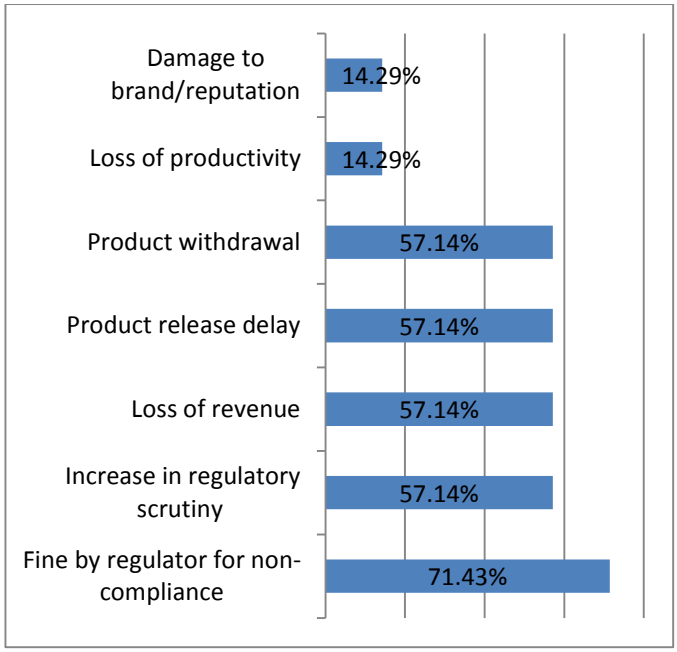

Figure 2: Consequences of supply chain disruptions

Question five: Considering the most significant disruption in the last five years, what was the approximate financial cost?Looking at the most significant disruptions, 43% of the respondents declared that the financial loss was more than 350.000 euro. However, for 29 % the cost was between 70.000 euro– 700.000 euro and for the others the loss was between 78.000 euro and 350.000 euro. Considering their size, the financial cost of the disruption was considerable.

4.2 Second part

Question one: What actions and strategies are implemented to increase the resilience of the company to disruptions? The results are presented in Figure 3.

All of them declared that they rely on multiple suppliers for many components they continuously collect information from different sources in order to be more prepared if the disruption happened. Many of the supply chain disruptions originated at the first tier supplier, so it is better to have a reserve supplier for every component. 71 % declared that they have an urgency team, trained to deal with major disruptions, and allows they allowed the information to freely move from the low to the high levels of the organization and vice versa. Only five of the companies interviewed had a supply chain risk management department.

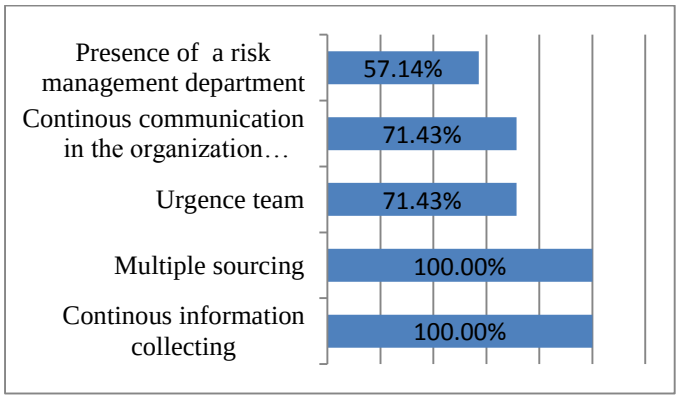

Figure.3: Strategies to increase resilience

Question two: Which of the following robust strategies have you commonly used to face the disruptions of the last five years? As it can be seen in Figure 4, all the companies have executed one of the robust strategies (the one mentioned in the literature review) to handle the supply chain disruptions. The most used strategies were strategic stock, flexible supply base and assortment planning.

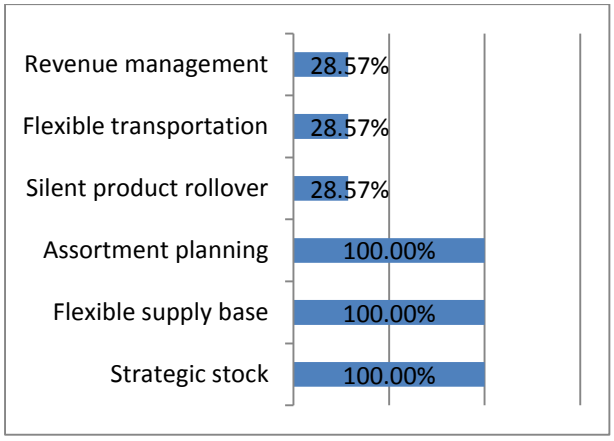

Figure 4: Robust strategies

5. Conclusions

All the main Albanian milk processing companies had faced at least one supply chain disruption in the last five years. Many of them had analyzed carefully each disruption to identify its origin. The disruptions mainly had occurred to their first tier supplier and clients. The sources of the disruptions were different from natural disasters (adverse weather) to accidents (product quality incidents, transport disruptions etc.) and to intentional disruptions (consumer insolvency, adverse media coverage etc.). The main source of disruption was energy scarcity and consumer insolvency. The government instead of helping the domestic companies to be more competitive and to meet the European standards, made the things more difficult by increasing the regulatory scrutiny and fines. These last two were the main consequences of supply chain disruptions. The consequences were not only financial but even nonfinancial like damage to brand reputation. The nonfinancial consequences are felt more in the long term.

All the companies declared that their survival in many cases depends on the success of handling the disruptions. The first step is to build a resilient company, able to face supply chain disruptions. According to them this can be achieved through multiple sourcing, as their suppliers face more disruptions; continuous sharing and collection of information and presence of a risk supply chain management department. They are realistic that all the disruptions cannot be foreseen, as time and resources are limited and because it is not possible. For this reason they implement different robust strategies. Normally, one size cannot possibly fit all, so each of them taking into consideration their structure, culture and type of disruption faced decide to execute one of the robust strategies. So the best strategy to handle supply chain disruptions, is being prepared and implementing a robust strategy to face the disruption. The proposition of the research is true according to these conclusions.

6. Recommendations and limits of the study

6.1 Recommendations for managers

The companies interviewed declared that the disruptions mainly originated at the first tier supplier and to the customers. So my suggestions for them are:

Flexible production: Decide if it is better to rely on multiple or single sourcing and always check for the weakest link in the supply chain. The next paragraphs explain each of them.

The flexibility of production can be increased by implementing all the three strategies: postponement, inventory of critical components and redundant capacity for critical products.

It is important that the production is flexible, in order to adapt to the sudden changes in supply and demand side. The flexibility of production is increased when products share the same components and process and they differ only at the last stage of production (postponement). In this way, when there is a component shortage, the products can be redesigned quickly or when the demand is instable, companies can produce standard semi-finished products and customize them when the demand will be more certain.

Always keep inventory of critical components. Critical components are the ones that can be produced only by few suppliers and are difficult to be found. Keep always redundant capacity, for important products that have unstable demand.

We are living in an uncertain world, and it is better to have more than one supplier. Many companies keep one supplier to meet their normal demand of components and another supplier in case of a sudden increase in demand for components. Some companies rely on many suppliers, as they want to secure the flow of components. If something happen to one supplier, the other supplier is available. But having many suppliers, means "destroying money and relationships". Destroying money as you have to invest money to find and keep many suppliers. If you rely on many suppliers, you cannot build strong relationships with each of them. Before deciding to rely on one or more suppliers, analyze the competition to see if any of your competitors rely on the same supplier. If you share the same supplier with your competitors, it is necessary to create strong relationships with your supplier and to analyze the supplier market in case of any inconvenience by the supplier side.

Today many supply chains are global and complex, so it is difficult to monitor and manage them. If one part of the supply chain is weak, all the supply chain will be weak. The best suggestion to discover quickly the weakest link is collaboration and continuously information sharing with all the companies in the supply chain. By collaborating with all the partners in the supply chain, the company can help them to meet its objectives and also it will know them better. Companies need to collaborate in normal times and especially in difficult times.

If companies exchange real -time information with their partners in the supply chain, they will notice immediately if something happen to them and vice versa. A small problem can bring big problems, so it is better to discover and solve it immediately.

6.2 Limits of the study and recommendations for future research

This study is focused only on the milk processing industry. Further research should expand the research in other industries.

As the research is focused just on seven major Albanian milk processing companies, it is important to stress that the results must be handled carefully and not be generalized.

No study has been done before in Albania about supply chain disruption, and I think that the results of this research will be of high practical importance for the Albanian milk processing companies.

7. References

[1] Business Continuity Institution. (2014). *Supply chain resilence.* UK.

[2] Christopher, M., & Peck, H. (2005). Building the resilient supply chain. *International Journal of Logistics Management, 15*(2), 1-14.

[3] Council of Supply Chain. (n.d.). *Supply chain definition*. Retrieved November 14, 2013, from http//www.supply-chain.com/info/faq.html.

[4] Craighead, C., Blackhurst, J., Handfield , R., & Rungtusanatham, M. (2007). . The severity of supply chain disruptions: Design characteristics and mitigation capabilities. *Decision Sciences Institute, 38*(1), 131-156.

[5] Farole, T., & Oliver, J. (2011, November 21). *Shoe molds and scuba divers: How natural disasters affect our supply chains*. Retrieved November 17, 2014, from World Bank: http://blogs.worldbank.org/eastasiapacific/shoe-molds-and-scuba-divers-how-natural-disasters-affect-our-supply-chains

[6] Hendricks, K., & Singhal, V. (2005). An Empirical Analysis of the Effect of Supply Chain Disruptions on Long-Run Stock Price Performance and Equity Risk of the Firm. *Journal of Production and Operation Management, 14*(1), 32-52.

[7] Instat. (2015). *Gross Domestic Product.* Retrieved December 2015, 15, from INSTAT: http://www.instat.gov.al/media/274761/produkti_i_brendshem_bruto_paraprak__2014_.pdf

[8] Juttner, U., Peck, H., & Christopher, M. (2007). Supply chain risk management:outlining an agenda for future research. *International Journal of Logistics : Research & Applications, V, 6*(4), 197-210.

[9] Lee, H. (2004). The triple A supply chain. *Harvard Business Review*, 2-14.

[10] Revilla, E., & Saenz, M. J. (2014). Supply chain disruption management: Global convergence vs national specificity. *Journal of Business Research, 67*(6), 1123-1135.

[11] Sheffi, Y. (2007). *The resilient enterprise: Overcoming vulnerability for competitive advantage.* Cambridge: Massachusets: The MIT Press.

[12] Tang, C. (2006). Robust strategies for mitigating supply chain disruptions. *International Journal of Logistics, 9*(1), 33-45.

[13] Vakhary, A., & Yenipazarli, A. (2009). Managing supply chain disruptions. *Technology, Information and Operation Management, 2*(1), 243-325.

[14] Wagner, S., & Bode, C. (2007). An imperical investigation into supply chain vulnerability. *Journal of Purchasing and Supply Chain Management, 12*(6), 301-3012.