

Causes of Losses in Supply Chains

Justyna Lewandowska, PhD

Poznań School of Logistics, Poland
Estkowskiego str 6. Poznan, Poland
justyna.lewandowska@wsl.com.pl

Abstract: Supply chains operating in the turbulent and extreme economic conditions, are exposed to many challenges. Changes in financial markets and political turbulence, socio-cultural, and finally the growing requirements of consumers become the cause of unexpected distortions. In turn, it promotes the occurrence of loss. These affect both individual entrepreneurs, as well as the entire network of cooperating organizations. The aim of the paper is to present the causes of and possible places of losses in the supply chain and taking into account the subsequent coming into its component cells.

Keywords: supply chains, the loss in supply chains, Lean Management

Introduction

The turbulence on the financial markets and political, socio-cultural change, increasingly demanding consumer behaviour and the rapid development of economic and industrial environment is modified significantly. The economic crisis of 2008, heavily staggered the stability of supply chains in the world. Declines in trade, the collapse of capital flows and currency quotations are just some of the instability factors of the supply chains. It is anticipated that in their result will return in the directions of movement of goods, services, as well as in their monitoring and planning standards.

Markets, whose role is increasing in the context of global supply chains are not only distance in time and space, but also cultural norms, transparency, intensity and use of surveillance tools and guarantees and ownership structure. These factors increase the risk of erode liquidity supply, and hence incurring losses. As research, 85% of the companies at least once experienced a crisis in the supply chain, which interfered with their activities. What's more, in 2010, 56% of the surveyed companies accounted for 1 to 5 such events [Ratnicyn 2012].

In business practice and the literature course you can find many different definitions of loss associated with different causes and their formation. The aim of measures taken is to identify considerations and reasons of loss of supply chains.

The author on the basis of the literature of the subject and reports based on the experiences of economic practices have trying to determine the intensity and the causes of this phenomenon.

1 The essence of supply chains

The supply chain is called a group of interoperable related companies in order to provide goods and services to the final customer. This chain encompasses all stages of the process, from obtaining basic raw materials necessary for the production, to sell the finished product to the final recipient, and even waste, arising after its use [Harrison and van Hoek, 2009]. However, in modern, dynamically evolving market, complexity of the economy is so large, that the determination of the present links between the actors as the "supply chain" is a far-reaching simplification. What's more, the pursuit of an economic activity, while maintaining a simple provider links-receiver is no longer possible.

As the original purpose of integration and supply chain processes identifies the delivery of benefits and creating value for customers, which is defined as a utility that has an impact on the value and price of a given product or service. Increased value for customers increases revenues and profits of enterprises involved in the supply chain [Witkowski, 2003]. As the overall objective of supply chains shows while maximizing effectiveness in his part of the business, which has lead to an increase in the added value of products, services and information. Decisions taken jointly by participants in the supply chain and cooperation at all levels (from product design and forecasting demand, by logistic activities, until the communication with customers) will affect the growth of a competitive individual links and increase the benefits achieved by the stakeholders. As economic realities, supply chains take the form of a complex network of various supplies as links [Witkowski 2003].

2 Disruption in supply chains

21st century supply chains are becoming increasingly global, the industry is heavily affected by the uncertainty which could potentially turn into a series of unexpected interference. Turbulance on the financial and political markets, socio-cultural changes and demanding consumer behaviour, the rapid development of economic and industrial environment modified substantially economic and industrial environment. The economic crisis of 2008, heavily staggered the stability of supply chains in the world. Declines in trade, the collapse of capital flows and currency quotations are just some of the instability factors of the supply

chains. Sources of changes in supply chains do not disappear along with the improvement of the financial situation on global markets.

Producers and traders must count with new challenges in the form of new raw materials and products from emerging markets. While companies entering these markets pose challenges to local market logistics. The traditional logistics solutions such as container transport and transshipment in ports slowly cease to satisfy the requirements of the globally operating companies. Markets, whose role is increasing in the context of global supply chains are not only distance in time and space, but also cultural norms, lack of transparency and oversight tools warranty and ownership structure. All these factors increase the risk of erode liquidity supply, and hence incurring losses.

In addition, more factors in increasing the risk of losses are as well unexpected natural disasters (such as earthquakes, tsunamis, floods, fires) that haunt the equally rich and poor countries, only poorer infrastructure of the latter causes a much the bigger the consequences of these disasters. The effects of the earthquake and tsunami in Japan and New Zealand in 2011 will have been directly 20% of organizations-participants of global supply chains, with head offices in 18 countries around the world and representing 12 different industries.

As research shows [Business Continuity Institute, 2011], 85% of the organization at least once experienced a crisis in the supply chain, which interfered with their activities. During the year, 56% of the enterprises accounted for 1 of 5 such events. The cause of the crises supply chains were mostly the collapse of weather and natural disasters (as indicated by more than 70% of respondents) and the failure of the IT systems, transport and telecommunications (over 60%), and fig 1.

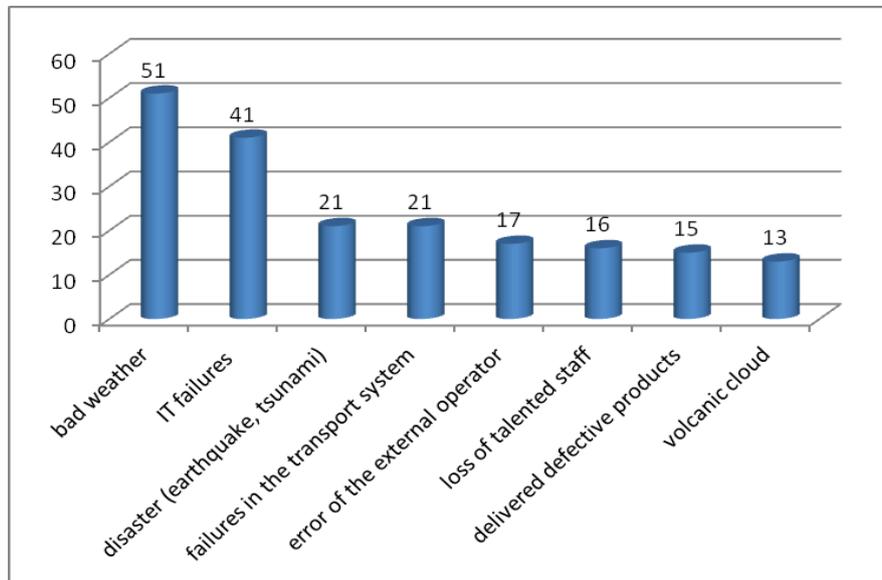


Figure 1

Causes of crises in the supply chain (%)

Source: Supply Chain Resilience 2011, the Business Continuity Institute

Supply chain crisis, as indicated by respondents, causes mainly the productivity reduction (50%), increasing labour costs (38%), and lower profits (38%). The long-term consequences of interference triggers are fears of shareholders (19%), the decline in the organisation's reputation (17%) and increasing control of the supply chain (11%). In the case of 17% of the polled companies the cost of a single incident in the supply chain amounted to at least 1 million euros.¹

The causes of these distortions are very different, but show what lies in their potential closing. The scale of those arising from causes independent (weather disasters) are difficult to predict and estimate the losses. However, a large part of the territory of the disruption is land to use.

¹ Business Continuity Institute, an international study on supply chain sustainability risks, sources of crises and their effects, as well as defense mechanisms. The study included managers of 550 companies from more than 60 markets, October 2011, Harvard Business Review Poland, November 2012, ISSN 1730-3591, p. R3

Many supply chains does not make use of its capabilities, and has hidden potential as emerging,²:

- 225 billion dollars of excess inventory in global supply chains
- 20% of the orders is completely unwarranted
- 10% of losses incurred between the distribution center and sales points
- 75% of new products has a defect
- 70% of the production time is wasted
- 20% empty space for transport with increased logistical costs by 5 to 8%

The Loss of these are only part of the real potential for improving the functioning of supply chains. The concept of loss therefore requires further definition. While the cost of supply chain management is estimated at 60-90% of the total costs.

3 The essence and causes of losses

Both in the literature, as well as the business practice operates many of the definition of loss term. Some of them relates only to lost items, not taking into account the cash losses. In another understanding, loss exists as indirect one e.g. stealing and losses in stocks and cash. Sometimes it is also assumed that the costs incurred in connection with the limitation of losses also should include general costs arising from losses. By definition, the loss, it's the fact that someone or something has been deprived of someone or something and lose, the loss arose after the assassination of someone or something [Sobolm, 2001]. In economics, it is understood that the loss is the value of the resources used by the unnecessary or inefficient performance [Miller, Pniewski and Polakowski, 2000]. The author studies agree that losses in the supply chain are on three levels, including: production, transport and storage and the place of sale.

3.1 The causes of formation of the loss at the production stage

The loss in supply chains can occur already at the production stage. Shortened product life cycles, easy access to information and increase their requirements forces entrepreneurs to enter the continuous innovation, which often have a negative impact on the quality of products and production process. In this connection, already at the stage of development of the product may be significant complications. Among the reasons, aspects such as poor identification of market

² Business Continuity Institute, an international study on supply chain sustainability risks, sources of crises and their effects, as well as defense mechanisms. The study included managers from more than 60 companies 550 markets, October 2011, Harvard Business Review Poland, November 2012, ISSN 1730-3591, str.R4

opportunities and constraints in this area and the lack of a clear definition of the product. Other reasons are private actions system process and a lack of adequate cooperation departments of the company and control over programme production. Inadequate identification of market opportunities often leads to a loss of expenditure on product related to a lack of demand. What's more, the resources used in the unsuccessful production process could be operated by another undertaking. In the case of poor discernment of market constraints, the company did not have the capacity to take corrective action. The cause of loss is also imprecise definition of a product that is able to satisfy the needs of customers after the introduction of amendments. These in turn can be expressed in monetary terms. One of the frequent causes of loss is the lack of involvement of executives in the precise characteristics of the project. This results in the course of its implementation of an unintended increase in costs, the decline in the quality of products, and sometimes the impossibility of the achievement of the objectives.

In another approach, proposed by the creators of the concept of Lean Management, manufacturing has seven categories covering losses that occur at the production stage. The first of these is overproduction, understood as the production of goods and services without taking into account the real needs of clients. It often leads to unjustified increase in employment, as well as the unnecessary costs of storage and transportation of surplus stocks. The second category are deficiencies resulting from mistakes and damaged supplies of raw materials and materials that affect the quality of manufactured goods. They imply the need to carry out repairs and alterations, are the cause of discards and enforce additional checks. Another factor affecting the formation of losses are unnecessary. Storage of excessive quantities of raw materials and consumables generates additional costs, increases the time meeting orders, increases the risk of damage to the products and delays. The concept of Lean Management, as the cause of the occurrence of loss, indicates the inappropriate methods of production, resulting from the application of the wrong materials, tools and procedures, despite the existing possibility to use cheaper but equally effective approaches. In this aspect, as the loss is also considered to provide a higher quality product than is necessary. Errors made by manufacturing enterprises is also unjustified transfer of work in progress for a considerable distance, inefficient means of transport and movement of materials between functional areas. Another cause of loss are also unproductive downtime in the production process. They are caused by the not usable capabilities of manufacturing process automation and delays arising from stocks, supply shortages or the formation of bottlenecks of production capacity. Factor for generating losses is also unnecessary movement of staff, understood as his unwarranted movement as a result of the inadequate organisation of workplaces [2002, Dolgova Liker 2005]. To this group of seven categories of losses, it should also be added the unused human potential (loss of time, skills, ideas), as a result of not taking account of the comments of employees or their non-alignment, inadequate systems used in the production process and the loss of energy, water and the pollution scale [Hutchins 2010, Liker, 2005].

3.2 The causes of formation of the loss in the area of transport and storage

In the literature one can meet estimates, according to which it is understood that every third loss incurred prior to delivery of the products to the place of sale [Lewandowska, 2005]. This indicates the high level of losses during transport and in warehouses and distribution centers. Activities such as handling, storage, packaging and delivery of the products shall be accompanied by not only the risk of damaging them, but also the risks associated with accidents at work at the place of storage of the goods or during loading. Their causes are blamed in the wrong handling of goods, as well as compliance with procedures, on which a significant influence is no time pressures related to urgent orders. Factor in causing accidents are also damaging by the not preserved equipment, causing further delays in the implementation of the orders.

In addition, at the time of transport and storage, the goods may be affected by adverse external factors. In this way, the loss is attributed to one of five groups: physico-chemical factors induced losses, losses arising as a result of adverse climatic factors, losses as a result of the stimulus measures, losses caused by the influence of biological factors and other losses for the aforementioned unfilled. The threats, which are the most common cause of damage to the goods, are hitting and compress. Their loss consequence of relying largely on transported and stored goods deformations. As another group of making losses factors indicate vibrations of goods both in storage and during transport [Korzeniowski, Skrzypek, Szyszka2010]. Another described a group of negative stimuli are climatic factors, including temperature changes. Logistics activities harmful for freight weight can be both increases and decreases in temperature, catalyst physical processes, biotic and chemical products. Unplanned changes in temperature can cause enlargement of the substance which leads, among other things to leak fluids from losing the tightness of packaging. Positive temperature spikes are also a threat of solids. Industrial products, food and pharmacological, produced using wax and paraffin in effect increasing temperature lose their desired shape, and even alter the texture. What's more, solids, whose melting point is contained in the ambient temperature intervals, subject to dissolution, losing the same properties and suitability for use. Among the negative effects of low temperature it indicate delamination, and as a result, the disintegration of the products. Lowering the temperature also causes irreversible changes in our products, which consists of water. Its freezing up and produce volume growth solutions, sublimation, resulting in cracks of containers. Unfavorable temperature, however, is not the only making loss factor in climate. The humidity of the air, and more specifically its sudden changes, have an adverse effect on the goods, for example, the cause of corrosive processes. Negative force acting on the transported and stored is also good solar radiation, causing yellowing of the paper and changes the colors of dyed goods. Another group of incentives that have a negative impact on the weight of goods are chemical agents. Among them is, first and foremost, losses following the uncontrolled chemical reactions

and leakage. Another cause of losses in the supply chain are biological factors, which include the impact of fungi, mold and bacteria, but also of animal organisms, such as rodents and insects [Korzeniowski, Skrzypek, Szyszka2010]. The last group of the losses occurring in the area of transport and storage are among others, the effects of exceptional events, including floods and fires.

The occurrence of loss can also be the result of improper use of information systems, often decisive for the effectiveness of the processes related to transport and storage. Among the common mistakes pointed out, poor location of goods in stock, producing incomplete deliveries and shipping delays. It also contributes to improper packaging and labelling, prepared for the transport of goods. Another consequence of the faulty system for the exchange of information is the corruption, caused both crossing the permissible storage time and inappropriate order of issue of goods from storage. As an example of this type of errors is also mentioned the lack of ability to grant recipient information on order status, as well as warning him about possible delays. All of these examples, they have insufficient quality of material management, affecting the increase in costs, inadequate resource utilization and errors in the process of customer service, which may result in its loss. Through reform and formalizing management information systems distribution is usually to achieve broader goals and higher-quality management systems.

3.3 Causes of loss in trade

In the area of trade, as the cause of the loss, it can indicate the procedural errors, internal and external theft and fraud [Beck and Chapman 2003]. Procedural errors include expired product or cut-price, incorrect pricing, problems associated with the identification of the product, incorrect estimation of the quantity of goods, make a mistake when scanning barcodes of the products and the errors associated with poor deliveries to the shops. The term internal theft is the illegal taking of goods or cash from sales service, carried out by personnel employed in the enterprise and employees cooperating units (e.g. support or protection of the facility). This is referred to as the outside staff theft, collusion between employees and customers, the goods unlawfully consumed by staff shortages at the box office and carried out premeditated price manipulations. Another category are thefts, which is defined as the unlawful appropriation of goods or cash from the sale of goods and services made by customers or employees not directly connected with the company. This group includes shop theft losses, returns and refunds, theft of cash and burglary. The last factor in losses in the trade are in the supply chain. Their cause are deliberately collected fees for goods, in accordance with the actual quantity of goods supplied. These losses are often due to the fact that the retailers are smaller phrases, than it has been previously established.

Conclusions

To sum up, the losses in the supply chain both on the chain, and at the level of the individual company. Part of their appearance, has only the nature of the contract. Losses resulting from mechanical damage or theft may occur in both the supplier of raw materials, manufacturing plant and distribution centre and at the point of retail sale. This is due to the fact that in all of these organizations the processes of planning, design and finally the transport and storage of the largest affected the human factor, which depends on the economic efficiency of these activities. The greatest difficulty in supply chain management makes the rationalisation of individual tasks, consisting on the functioning of the entire organization. They ultimately affect the quality of the whole chain of actions, which often determines not only the quality of functioning of national economies, but also about the quality of the global economic environment and natural.

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