

LAPPEENRANTA - LAHTI UNIVERSITY OF TECHNOLOGY LUT

LUT School of Business and Management

Master's Degree Programme in Supply Management

Olli Crockatt

**IDENTIFICATION AND MITIGATION OF RISKS IN AN EXPORT
SUPPLY CHAIN: CASE OF FINNISH DAIRY COMPANY EXPORTS**

1st Supervisor: Professor Katrina Lintukangas

2nd Supervisor: Professor Veli-Matti Virolainen

ABSTRACT

Author: Olli Crockatt

Title: Identification and mitigation of risks in an export supply chain: Case of Finnish dairy company exports

Faculty: LUT School of Business and Management

Major: Supply Management

Year: 2020

Master's thesis: 69 pages, 11 figures, 6 tables, 1 appendix

Examiners: Professor Katrina Lintukangas
Professor Veli-Matti Virolainen

The aim of this thesis is to study how the risks of international business affect export supply chains. This is achieved by identifying supply chain risks, their affects and their mitigation in the case company's export supply chain. Literature is studied to form a categorisation of supply chain risks that was used in the interviews at the case company to find answers to the research questions. Mitigation methods for identified risks were examined and suggestion were made for future supply chain risk mitigation efforts. The case company in question operated in the dairy industry and all of the export supply chains consisted of consumer products.

Keywords: Supply chain risk management, risk management, supply management, risk mitigation, dairy industry, export supply chain.

TIIVISTELMÄ

Tekijä: Olli Crockatt

Tutkielman nimi: Riskien tunnistaminen ja hallinta vientitoimitusketjussa:
Tapaustutkimus suomalaisessa meijeriyrityksessä,

Tiedekunta: Kauppatieteet

Pääaine: Hankintojen johtaminen

Vuosi: 2020

Pro gradu -tutkielma: 69 sivua, 11 kuvaa, 6 taulukkoa ja 1 liite.

Tarkastajat: Professori Katrina Lintukangas
Professori Veli-Matti Virolainen

Tämän tutkielman tavoitteena on selvittää miten kansainvälisen liiketoiminnan riskit vaikuttavat case yrityksen vientitoimitusketjuun. Tämä toteutetaan tunnistamalla riskejä, niiden vaikutuksia ja niiden hallintaa yrityksen vientitoimitusketjuissa. Kirjallisuuden pohjalta muodostettiin toimitusketjuriskien kategoria, jonka perusteella suoritettiin haastattelut case yrityksessä. Näiden haastattelujen pyrkimyksenä oli vastata tutkimuskysymyksiin. Yksittäisten riskien hallintaan kuvailtiin tutkimuksessa ja edotuksia case yrityksen tuleviin riskien hallintatilanteisiin annettiin. Tutkimuksessa oleva case yritys toimii meijeri alalla ja sen vientitoimitusketjussa olevat tuotteet olivat kuluttajatuotteita.

Hakusanat: Riskien hallinta toimitusketjussa, riskien hallinta, toimitusketjujen johtaminen, meijeri teollisuus, vientitoimitusketjut.

LIST OF TABLES AND FIGURES

Table 1: Summary of risks

Table 2: Key collaboration activities

Table 3: Strategies to achieve flexibility

Table 4: Different costs and responsibilities of Incoterms 2010.

Table 5: Interviews conducted at the case company.

Table 6: Risk management process

Figure 1: Conceptual framework of the thesis

Figure 2: Thesis structure

Figure 3: Supply chain risk management

Figure 4. Risk in the extended supply chain

Figure 5: Risk sources in Supply Chains

Figure 6: Triple A -supply chain principles

Figure 7: Risk mitigating strategies

Figure 8: Thesis risk categories

Figure 9: Export supply chain to the United Kingdom

Figure 10: Export supply chain to Spain

Figure 11 : Export supply chain to Poland

1	INTRODUCTION	1
1.1	Literature review	2
1.2	Research questions.....	4
1.3	Thesis framework	6
1.4	Thesis structure	7
1.5	Definitions.....	9
2	SUPPLY CHAIN RISK MANAGEMENT	10
2.1	Supply chain management.....	11
2.2	Risk management.....	12
2.3	Definitions of risk	13
2.4	Supply chain risks categories	14
2.5	Supply chain risk mitigation	21
3	RESEARCH METHODOLOGY AND DATA COLLECTION	30
3.1	Data collection	30
3.2	Data analysis	33
3.3	Research gap and limitations	34
4	SUPPLY CHAIN RISK IDENTIFICATION AND MITIGATION IN CASE COMPANY	
	35	
4.1	Case company background.....	35
4.2	Supply risks	36
4.3	Operational or Organisational risks	38
4.4	Environmental risks	42
4.5	Transport risks.....	43
4.6	Demand risks	46
4.7	Security risks	48
4.8	Financial risks.....	49

4.9	Incoterm selection	51
4.10	Insurance coverage.....	53
4.11	Country Specific Export Supply Chains.....	55
4.11.1	United Kingdom – Distributer problems and blurred lines of ownership 56	
4.11.2	Spain – Competitive environment demands flexibility.....	58
4.11.3	Poland – Disrupted distributer information flows.....	60
5	DISCUSSION.....	62
5.1	Summary of results.....	63
5.2	Managerial Implications and suggestions.....	66
5.3	Limitations	68
5.4	Future research	69
	REFERENCES	70
	INTERVIEW FORM.....	75

1 INTRODUCTION

According to Business Finland's Food from Finland -scheme Finnish food and beverage companies are attempting to find new business opportunities abroad (Food From Finland, 2009). The same can be said for the dairy company in this thesis which is finding new market areas to explore for its consumer products. According to the Agricultural Economics Society and European Association of Agricultural Economists (EAAE) (2015) there will be significant change in the EU dairy sector between the years 2015-2020. They state that in order for EU dairy producers to stay competitive they will have to produce high-quality, low-cost products with minimum environmental impact, combined with an efficient customer-focused processing sector.

The current trend of globalization has provided companies with several new opportunities but in addition, it has made companies face new challenges (Wiengarten et al., 2016). Growing global competition and the complexity of supply chains are increasing the likelihood of not reaching desired levels of performance in supply chains which is mainly the result of supply chain failures. Companies need to plan for disruptions and develop contingency plans as they design and develop their supply chains. This will enable them to implement risk management plans to identify, or at least mitigate, contain and control supply chain risks. (Tummala & Schoenherr, 2011) Furthermore, due to the perishable nature of products in the food industry, organisations pay a disproportionate penalty when supply chain risk realize due to their liability for unsold stock which cannot be returned or sold elsewhere (Adebanjo, 2009). For a long-life cycle product, a 10-day disruption in the supply chain can be seen as problematic and can cause issues but for a product with a short life cycle disruptions can be catastrophic (Tomlin, 2009).

The objective of this thesis is to find answers for the question how risks of international business may affect export supply chains. The thesis will first make a comprehensive review of existing literature to find the most prominent supply chain risks that can be found in export supply chains. In addition, this thesis will conduct

a similar review of supply chain risk mitigation methods. After reviewing prominent literature, the thesis will conduct a qualitative case study at the case company in the dairy industry where material will be gathered by interviews. This will provide real life examples on what kind of supply chain risks are present and what risk mitigation methods are used and how they affect export supply chains.

1.1 Literature review

In existing literature there are several categorizations of supply chain risks that coexist. These categorizations clarify the relevant dimensions of potential disruptions faced by organizations in supply chains and provide the basis for risk assessment. (Juttner, Peck & Cristopher, 2010) For example, Manuj and Mentzer (2008) divide sources of risk into the following categories: Supply risks, operational risks, demand risks, security risk, macro risks, policy risks, competitive risks and resource risks.

The first four risk categories in Table 1: supply, operational, demand and security risks are specifically associated with supply chains as they disrupt operations of matching supply and demand. The remaining risks categories manifest themselves as a combination of supply, operational, demand and security risks. (Manuj & Mentzer, 2008)

According to Lintukangas et al. (2014) risks in a supply network can be various levels such as macro-level, meso-level and micro-level. Macro-level risks include political and government, macro economical, legal, social and natural risks. Meso-level risks include project selection, finance, design and operation risks. Micro-level risks include business relationships and third-party risks.

Juttner, Peck & Cristopher (2010) suggest that supply chain related risks fall into the following three categories: environmental risk sources, network related risk sources and organisational risk sources. Environmental risk sources contain any

uncertainties arising from supply chain -environment interaction. These can be strikes at factories, terrorist attacks or extreme weather conditions that cause damage. Network related risk sources arise from interactions between organisations within the supply chain. Organisational risk sources are found within the supply chain parties and can originate from a variety of sources including labour, production uncertainties and IT-system uncertainties. (Juttner, Peck & Cristopher, 2010)

Manuj and Mentzer (2008) argue that there is a wide understanding in supply chain literature about the risks and vulnerabilities of complex supply chains. However, there is a lack of frameworks, empirical evidence to understand the phenomenon of global supply chain risk management. They present a five-step process for global supply chain risk management and mitigation. These steps consist of: 1. Risk identification, 2. Risk assessment and evaluation, 3. Selection of Appropriate risk management, 4. Implementation of SCRM strategy and 5. Mitigation of supply chain risks. More recently Tummala and Schoenherr (2011) have adopted a classical risk management approach and used it in a supply chain environment where the process consists of five phases: risk identification, risk measurement, risk assessment, risk evaluation and, risk control and monitoring.

Miller (1992) distinguished five generic strategies companies undertake to mitigate risk from a single organisation view. According to Juttner, Peck & Cristopher (2010) four of these can be adapted to supply chain context: 1. Avoidance, 2. Control, 3. Co-operation and 4. Flexibility. Avoidance occurs when companies drop specific products, geographical markets, suppliers or customer organisations because management considers the risk associated with operating in a product or geographic market to be unacceptable. Control can be seen as strategies such as vertical integration or imposing contractual obligations. In co-operation, the focus is on joint agreements between organisation, sharing information on exposures to specific risk sources and preparing joint business continuity plans. Contrary to control, flexibility increases responsiveness while leaving predictability of factors unchanged. An example of flexibility is where companies delay the decision to make, configure, label or ship a product to a destination.

Incoterms are a group of rules that define the rights and obligations of buyers and sellers in the context of international trade. When companies select incoterms, their aim is to maximize their profits while minimizing uncertainty and risks. Incoterms address fundamental questions of international trade and provide answer to questions such as: 1. Who is responsible of transaction costs? 2. When and at what point is the risk (loss or deterioration of goods) transferred from seller to buyer? and 3. Who is responsible of the import and export customs formalities? (Jimenez, 1998)

In the field on international transportation, incoterms are used to establish the respective responsibilities of the trading parties. The selection of incoterms is often viewed as a difficult choice for companies because of general lack of knowledge on the subject because incoterms are often viewed as a constraint rather than an opportunity to improve efficiency in international deals. In addition, there is a link between Incoterm choice and performance in the sense that it can improve competitiveness and be a source of company profitability (Hien et al. 2009)

1.2 Research questions

This chapter reviews the research questions of this thesis. During the literature review it becomes apparent that supply chain risk management has been researched extensively for the past two decades. However, research conducted in the food or dairy industries has been limited. This thesis aims to take supply chain risk management and more specifically supply chain risk identification and mitigation and apply them to the dairy industry environment. In addition, the products in question are dairy products where the end customer is the consumer. This chapter will begin by introducing the sub research question first, since it is these two sub research questions that ultimately answer the main research question.

The first sub-research questions is:

“What are the supply chain risks for dairy industry exports?”

This research question refers to the identification of risks in the export supply chain. International business exposes different risks to an exporting company and this research question aims to answer what kinds of risks can be identified in the case company's export supply chains. This thesis examines existing literature on supply chain risk management and aims to build a categorisation of supply chain risks that is used to form an interview structure for the empirical part of this thesis.

The second sub research question is:

“How can companies mitigate these risks?”

As the first sub research question aims to identify different risks in the export supply chain in the case company, this question aims to identify methods used to mitigate these risks. First mitigation methods are researched from the supply chain risk management literature and after this they are reflected against mitigation methods identified from the empirical research.

The main research question is the following:

“How the risks of international business may affect export supply chains?”

The main research combines the results of the sub research questions to answer the question how the risks of international business may affect export supply chains. These affects can be actions or contingency plans that companies must put in place in order to manage supply chain risks or consequences of risks realised in their export supply chains. The case company's export supply chains of consumer dairy product to export markets such as the United Kingdom, Spain and Poland serves as a basis for this empirical analysis. In addition, this thesis proposes suggestions for managers to manage these affects.

1.3 Thesis framework

In figure 1 the conceptual framework of the thesis is presented. Figure 1 shows the key concepts that are supply chain risk management, risk identification and risk mitigation. It illustrates that the research is limited to examining supply chain risks and their mitigation in export supply chains. In addition, the framework shows the flow of goods in the export supply chain from the factory to distributors and onwards to grocery chains.

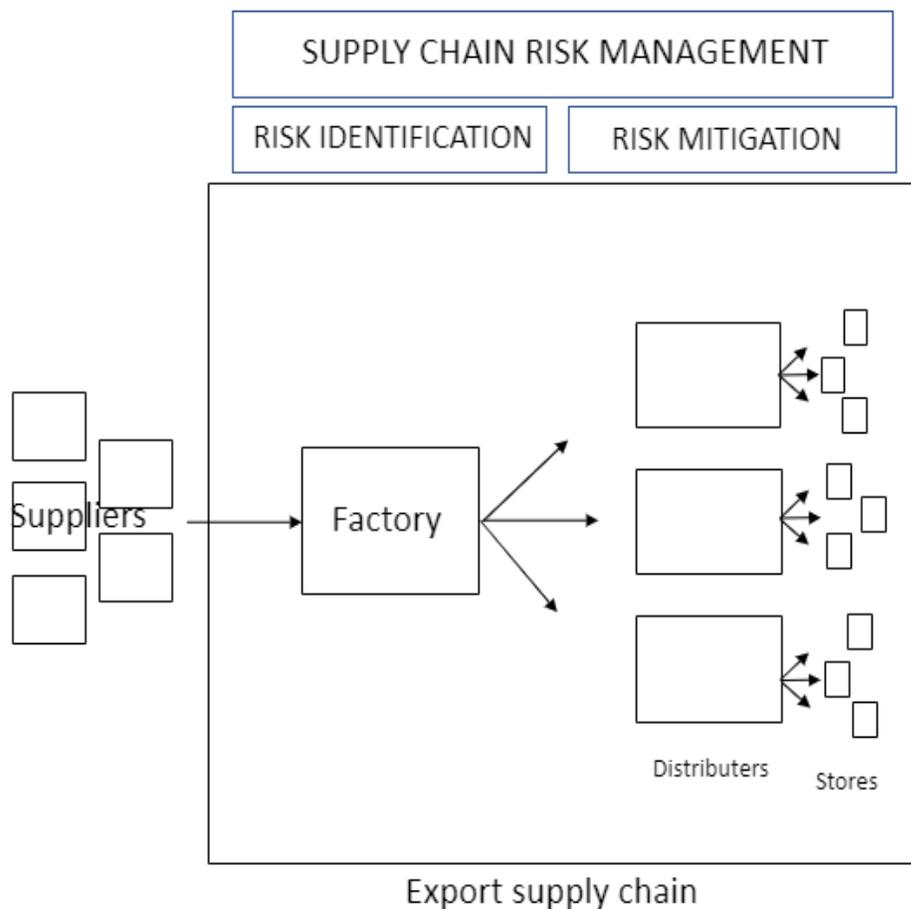


Figure 1: Conceptual framework of the thesis.

1.4 Thesis structure

In this chapter the structure of this thesis is presented. The structure is visualized in Figure 2 below. In the first chapter will make an introduction to the thesis and its contents. The chapter consist of background of the thesis, a literature review of the topic, framework and key concepts, thesis structure and definitions.

Chapter 2 is the theory chapter of this thesis that forms the framework for this study. In this chapter areas of supply chain risk management such as risk management, supply chain management, supply chain risks and mitigation are studied. Purpose of this chapter is to form a categorisation of supply chain risks that can be used as a basis for the empirical research. In addition, mitigation methods found in the theory are mirrored against those found in the empirical analysis.

Chapter 3 explains the research methodology used in this thesis and provides other information such as data collection and analysis, research gaps and limitations of this thesis. Chapter 4 is the empirical part of this thesis where the qualitative study is conducted and the results of the semi-structured interviews in the case company are presented. In addition, at the end of the chapter export supply chain specific supply chain risks are presented.

Chapter 5 will conclude the thesis and will summarize the findings of this thesis and answer the research questions. In addition, chapter 5 will present managerial implications and suggestions, future research and limitations of this thesis.



Figure 2: Thesis structure

1.5 Definitions

Supply chain risk management: The identification and management of risks for the supply chain, through a co-ordinated approach among supply chain members, to reduce supply chain vulnerability. (Juttner, Peck & Cristopher, 2010, 201) In this thesis supply chain risk management will focus on export supply chains.

Supply chain management: “The management of a network of relationships with a firm and between organizations and business units consisting of material suppliers, purchasing, production, facilities, logistics, marketing, and related systems that facilitate the forward and reverse flow of materials, services, finances and information from the original producer to final customer with the benefits of adding value, maximizing profitability through efficiencies, and achieving customer satisfaction” (Stock & Boyer, 2009).

Co-operation: from a supply chain perspective focuses on agreements between organisations within the supply chain to improve supply chain visibility and understanding, share information on exposures to risks and to construct joint continuity plans. (Juttner, Peck & Cristopher, 2010)

Risk: Potential or unwanted negative consequences that can arise from an event or activity. (Rowe 1980)

Risk mitigating strategies: Strategic moves organisations deliberately undertake to mitigate the uncertainties identified by from various risk sources. (Miller, 1992)

2 SUPPLY CHAIN RISK MANAGEMENT

This chapter will explore literature that is published in respectable management journals in the area of supply chain risk management. This theory chapter forms the framework of this thesis and discusses different key areas of supply chain risk management such as supply chain management, risk management, different categorisations of risk, significant risks that are prevalent in supply chains and risk mitigation methods.

Blos et. al. (2009) argue that the issue of supply chain risk management can be addressed along two dimensions: Supply chain risk and a mitigation approach. Figure 3 illustrates the dimensions of supply risk management that are risk management and supply chain management.

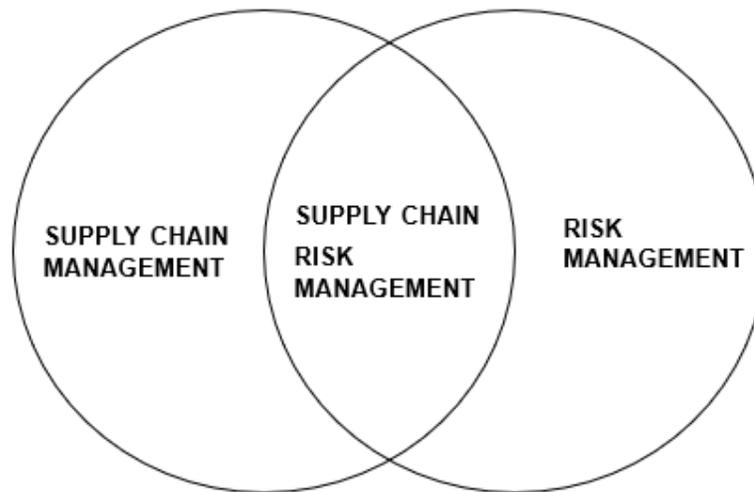


Figure 3: Supply chain risk management (Adapted from Blos et. al. 2009)

2.1 Supply chain management

The term supply chain management is a relatively new term and first appeared in 1982 and was used to connect logistics with other functions (Khojasteh 2018). Later, the terms emphasis was on facilitating movement of goods and products and coordinating supply and demand. Logistics managers in retail, grocery and other high inventory business realised that they could gain competitive advantages by managing materials through inbound and outbound channels (Bechtel & Jayaram, 1997). In the early stages, SCM was mainly spoken in purchasing literature but has since evolved to emphasise the process of fulfilling the needs of consumers by supplying goods and services (Van der Vorst & Beulens, 2002).

According to Stock & Boyer (2009) there has been confusion amongst supply chain researchers about the several definitions that have been proposed in the literature for supply chain management. Most scholars agree that supply chain management consists of coordination and integration, cooperation among supply chain members and the movement of materials to the final customer. However, there are varying conceptualisations by supply chain academics and practitioners. In this thesis we adapt the definition by Stock & Boyer (2009) that defines Supply chain management as the following: “The management of a network of relationships with a firm and between organizations and business units consisting of material suppliers, purchasing, production, facilities, logistics, marketing, and related systems that facilitate the forward and reverse flow of materials, services, finances and information from the original producer to final customer with the benefits of adding value, maximizing profitability through efficiencies, and achieving customer satisfaction”.

2.2 Risk management

Companies have been aware of the need for risk management and contingency planning for some time and a wide body of literature exists from diverse fields such as economics, finance, strategic management and international management (Juttner, Peck & Christopher, 2010). In recent years, risk management has emerged as an important contributor in the fields of management decision and control. Global competition, technological change and aspirations to seek competitive advantage are primary motives for organisations to adapt risk management approaches. (Ritchie & Brindley, 2007)

An important part of risk management in practice is the risk management process that consists of five phases (Tummala & Schoenherr, 2011):

- 1) Risk identification
- 2) Risk measurement
- 3) Risk assessment
- 4) Risk evaluation
- 5) Risk control and monitoring

According to Kaplan & Mikes (2012) it is important to understand the qualitative distinctions among the types of risks that organisations face. They argue that risks fall in to three categories: preventable risks, strategy risks and external risks. Preventable risks are risks that arise from within the organisation. These risks can be, for example, incorrect actions of managers or breakdowns in routine operational processes. They add that risk events from any of these categories can be damaging to a company's strategy and survival.

2.3 Definitions of risk

When researching the risks in academic literature it becomes clear that there is a broad spectrum of definitions of risks. In addition, there are terms such as disruption and uncertainty that are often used in a way that makes them indistinguishable from the term risk. Therefore, the author of this thesis finds it important to distinguish, here in this chapter, the differences between these terms and clarify what definitions are used in this thesis.

Kleindorfer and Saad (2005) argue for two broad categories of risk affecting supply chain design and management: 1. Risks originating from coordinating supply and demand and 2. Risks originating from the disruption of normal activities. Papers in the field of supply chain risk management appear to have been split in to two different categories. The first group classifies different supply chain risks. Others focus on supply chain disruptions that Snyder et al. (2016) define as “random events that cause a supplier or other element of the supply chain to stop functioning, either partially, for a (typically random) amount of time”. In other words, it is difficult to make a distinction how disruption risks differ from other supply chain risks besides the fact that they do not originate from coordinating supply and demand.

Another term that is prevalent in supply chain risk management literature is uncertainty. Supply chain uncertainty refers to situations where decision makers do not definitely know what to decide because the objectives are uncertain because of lack of information or understanding about the supply chain or its environment. Partnerships with key suppliers and customers can reduce uncertainty and minimize risks while simultaneously maintaining Flexibility. (Van der Vorst & Beulens, 2002) In other words, uncertainty is the lack of complete certainty.

Juttner, Peck & Christopher (2003) argue that the word risk can be misleading because it is perceived as a multidimensional construct. They present two dimensions of risks: risks sources and risk consequences. The word risk is used to describe uncertain internal or external, environmental variables that reduce outcome predictability. This kind of use refers to a source of risk and uncertainty

that can be for example, political risks, market risks or volatility of customer demand. In addition, the term risk is used to describe consequences of risk. For example, operational risks, human risks, and risks to customer service levels are consequences of risks becoming events.

2.4 Supply chain risks categories

Risk identification involves a thorough and structured investigation of potential supply chain risks associated with the case problem in question. Risks in the supply chain management originate from two main areas: supply and demand (Blos et al. 2009). Familiarizing and understanding supply chain risks thoroughly is critical that risks can be identified, and mitigation measures can be implemented. (Tummala & Schoenherr, 2011). Just as risks facing individual companies, supply chain risks can be categorised in various ways and from different perspectives (Leat & Revoredo-Giha, 2013). This chapter reviews different classifications of risks that can be found in the supply chain management literature (Manuj & Mentzer, 2008; Tummala & Schoenherr, 2011; ; Juttner, Peck & Christopher, 2010)

According to Manuj & Mentzer (2008) risks in the supply chain can be quantitative or qualitative. Quantitative risks include lost sales through means of stock-outs, overstocking, customer discounts or insufficient availability of components and/or materials in the supply chain. Qualitative risks include a shortage of accuracy, reliability and precision of components or materials in the supply chain. Manuj & Mentzer (2008) developed a categorization of supply chain risk sources to better understand qualitative and quantitative risks. These sources of risks were divided into supply risks, operations risks, demand risks, security risks, macroeconomic risks, policy risks, competitive risks and resource risks. These risks are visible in Table 1.

Type of risk	Source
Supply Risks	Disruption of supply, inventory, schedules, and technology access; price escalation; quality issues; technology uncertainty; product complexity; frequency of material design changes
Operational Risks	Breakdown of operations; inadequate manufacturing or processing capability; high levels of process variations; changes in technology; changes in operating exposure
Demand Risks	New product introductions; variations in demand (fads, seasonality, and new product introductions by competitors); chaos in the system (the Bullwhip Effect on demand distortion and amplification)
Security Risks	Information system security; infrastructure security; freight breaches from terrorism, vandalism, crime and sabotage.
Macro Risks	Economic Shifts in wage rates, interest rates, exchange rates, and prices.
Policy Risks	Actions of national governments like quota restrictions or sanctions
Competitive Risks	Lack of history about competitor activities and moves
Resource Risks	Unanticipated resource requirements

Table 1: Summary of risks (Adapted from Manuj & Mentzer 2008)

The first four risks of Table 1, supply risks, operational risks, demand risks, and security risks, can be specifically associated with supply chains because they directly disrupt operations that match supply and demand. The location of these risks in the supply chain are visualized in Figure 4. A key characteristic of most supply chain risks is that they do not exist in isolation and are overlapping. Specifically, macro, policy, competitive and resource risks manifest themselves as a combination of supply, operational, demand and security risks. For example, changes in wage rates can appear as a supply, demand or operational risk depending on what part of the supply chain it manifests. Due to this reason Manuj

and Mentzer focus on Supply, operational, demand and security risks in their study. (Manuj & Mentzer, 2008)

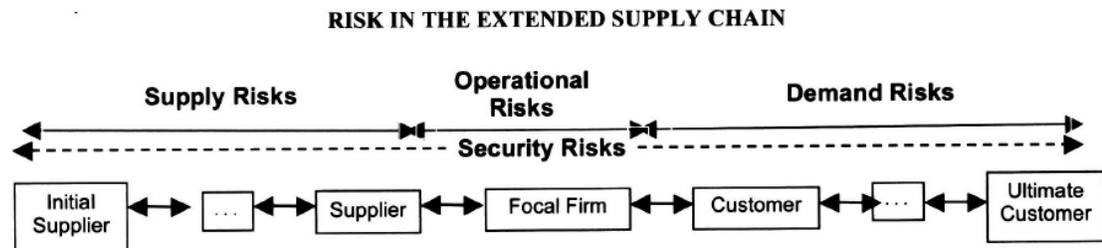


Figure 4. Risk in the extended supply chain (Manuj & Mentzer 2008)

Zsidisin (2003a) argues that every purchasing organisation experiences supply risks, even though it is not necessarily understood, assessed and managed. In addition, he claims that supply risk is a multifaceted concept because it includes sources and outcomes. Supply risks arise from movement of materials from a supplier to the focal company and can include the reliability of suppliers, single versus dual sourcing, make or buy decisions, centralised versus decentralised sourcing and security issues (Manuj & Mentzer, 2008). Individual supplier failures tend to be cause of realised supply risk and typical causes are inability to handle demand fluctuations, quality issues and the inability to keep up with technological innovation (Zsidisin, 2003a). Like the definitions of risks and their categories of this thesis, purchasing organisations perceive risk as a multi-dimensional construct. Therefore, supply risk can be defined as: “the probability of an incident associated with inbound supply from individual supplier failures or the supply market occurring, in which its outcomes result in the inability of the purchasing firm to meet customer demand or cause threats to customer life and safety” (Zsidisin, 2003a). Scandals from the past few decades in food supply chains, for example of the milk melamine scandal of 2008, have awakened the attention of customers and have put the pressure on companies to be responsible regarding consumer safety (Lintukangas, Kähkönen & Ritala, 2015).

Operations or organisational risk refers to risks that may affect the focal firm's ability to produce goods and services at the desired level of quality, timeliness and profitability (Manuj & Mentzer, 2008). Juttner, Peck & Christopher (2003) argue that organisational risks extend to the whole supply chain and can arise from any member or party in a company's the supply chain. In this thesis, operations and organisational risk are combined because of the similarities in content from different authors. Rao & Goldsby (2009) identify three sub-categories of operations uncertainty: labour uncertainty, firm-specific input supply uncertainty and production uncertainty. Labour uncertainty can be the result of a decline of employee productivity due to labour unrest or strikes. Firm specific input supply uncertainty can be the result of a shortage of raw materials or quality changes of those raw materials or parts. The final sub category is production uncertainty. This type of uncertainty can be a result of breakdowns in core operations of the company such as manufacturing machinery that would result in variations in the goods quality. (Manuj & Mentzer, 2008; Rao & Goldsby, 2009) Other sources of operations/organisational risks are changes in operating exposure, for example a company can be exposed to exchange rate risks when beginning exports in new markets (Manuj & Mentzer, 2008). In addition, IT-system uncertainties can in addition be a source of operations/organisational risk.

Demand risks are possibilities of events that are associated with the outbound flows of a company and these events can affect the probability of customers placing orders to the focal firm. (Manuj & Mentzer, 2008) Demand risks can be triggered by: order fulfilment errors, inaccurate forecast due to longer lead times, product variety, demand swings, seasonality, short life cycles, small customer base, information distortion due to sales promotions and incentives, lack of supply chain visibility and exaggeration of demand during product shortage (Tummala & Schoenherr, 2011; Chopra & Sodhi, 2004). Forecast risks are closely associated with demand risks because they result from a mismatch between a company's projections and actual demand. If forecasts are too optimistic they can result in an excess inventory and markdowns of prices. Contrarily, if forecasts are too low they can lead to stock shortages or stockouts and products might not be available to sell. (Chopra & Sodhi, 2004) An appropriate example of demand risks is the Bullwhip effect. The Bullwhip

effect occurs when information from one end of a supply chain to the other is distorted and is caused by players rational behaviour within the supply chain. One of the key causes is demand forecast updating, where the demand forecasts are distorted in a way that the manufacturers demand forecast is greater than the customers demand resulting in excess inventory and costs. (Lee, Padmanabhan & Whang, 1997)

Security risk sources can arise from the used infrastructure the company uses in its supply chain such as waterways, highways and airports. Freight breaches can violate the integrity of shipments and can render the contents of shipments unfit for sale. These can be the result of criminal activity such as theft or smuggling. (Manuj & Mentzer, 2009) In temperature sensitive food supply chains, the integrity of shipments is especially sensitive. If containers are opened during shipments, they cannot be sold on to customers. Information security is a threat of a third-party individual or organisation whose motivation is to steal data, trade secrets or intellectual property (Manuj & Mentzer, 2008). Profitability and business models often rely on maintaining a competitive advantage and realised intellectual property-risk can have long term consequences (Chopra & Sodhi, 2004).

Juttner, Peck & Christopher (2003) suggest that supply chain risk sources fall into three categories: environmental risk sources, network-related risk sources and organisational risk sources. These categories are visualized in Figure 5. Environmental risk sources include uncertainties that arise from supply chain environment interaction. They may be the result of accidents, socio-political actions or events such as earthquakes or extreme weather conditions that the authors describe as “acts of God”. Environmental risk variables are those that affect the business context across industries operating in that environment. In addition, even though the affect may vary across industries, everyone in that environment will be affected to some extent by way of general environment uncertainties. Political uncertainty can be recognised as a risk stemming from the environment in which the companies operate in and can include a weak governments impact on companies operating in the country, changes in the political system due to war, revolutions or other political disturbances. Rao & Goldby (2009) A fitting example of

political uncertainty is the ongoing process of the United Kingdom withdrawing from the European Union better known as Brexit. Companies have had to prepare for three key issues as the Brexit process is ongoing: increased market volatility due to uncertainty over withdrawal negotiations, exchange risks due to a fluctuating pound and higher inflation and interest rates in the United Kingdom (Hodge, 2017).

Network-related risk sources arise from interactions between organisations within the supply chain. All damage that is caused by subpar interactions between organisations within the supply chain can be attributed to network-related sources. In addition, the authors distinguish between three types of network-related risk sources: lack of ownership, chaos and inertia. (Juttner, Peck & Christopher, 2003) Networking has become an essential part of an organisation's competitive success. Networking as well as partnerships are no longer considered an option but a necessity. (Hallikas, Virolainen & Tuominen, 2002)

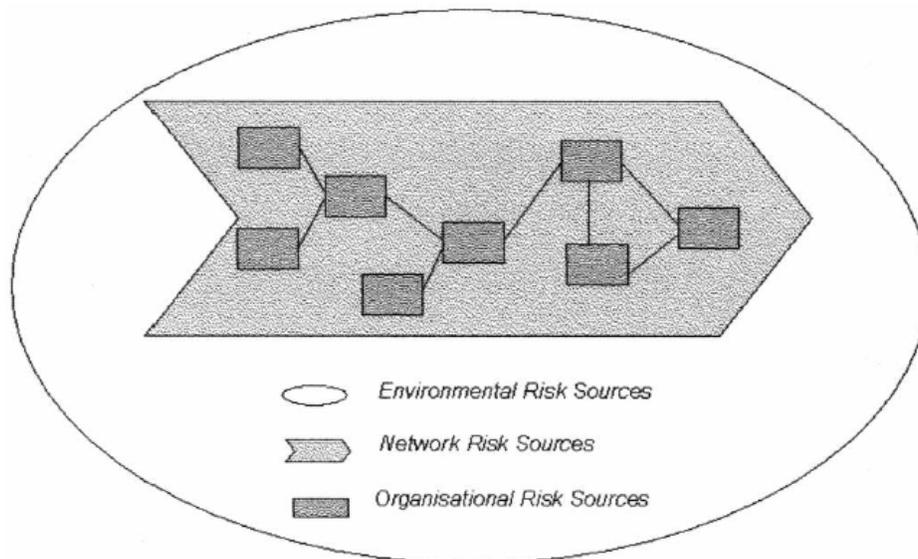


Figure 5: Risk sources in Supply Chains (Juttner, Peck & Christopher, 2003)

In supply chains, risks source related to lack of ownership result from blurring boundaries between buying and supplying companies in the chain. Prompted by trends such as outsourcing and concentration on core competencies, the increased

use of manufacturing, distribution and logistics partners can result in complicated networks of business relationships with confused lines of responsibility. Realised risks can result in inventory costs due to product obsolescence, markdowns or stock-outs, which are passed on among the organisations in the supply chain. (Juttner, Peck & Christopher, 2003)

The second network-related risk source is chaos. Due to the complex nature of supply chains, complexity can result in chaos effects. These effects can be overreactions, unnecessary interventions, second guessing, mistrust, distorted information along the supply chain or lack of supply chain understanding among its organisations. (Juttner, Peck & Christopher, 2003)

The third and last network-related risk source is inertia. Inertia risks are a general lack of responsiveness to changing environmental conditions and market signals. This is prevalent in global supply chains where flexibility is often sacrificed for cost reduction. Inertia risks can inhibit a company's ability to react to competitor moves, changing customer demand or other unpredicted events arising from environmental or organisational risk sources. (Juttner, Peck & Christopher, 2003)

Chopra & Sodhi (2004) researched categories of supply chain risks, their drivers and various mitigation strategies. This categorisation differs from the others in that it is very specific and easy to understand. This may be due to the fact that it was intended for managers to understand the variety and interconnectivity of supply chain risks in order to create effective strategies to mitigate risk for their companies.

2.5 Supply chain risk mitigation

This chapter a review is conducted on what kinds of mitigation methods are found in supply chain risk management literature.

According to Tang & Tomlin (2008), supply chain risks can be mitigated in two ways: 1. reduce the probability of undesirable events and 2. reduce the negative implications of those events. They argue that there are two mechanisms to reduce the probability of undesirable events. The first mechanism is a warning system that aims to prevent undesirable events from happening. An example of this kind of mechanism can be a smart container system that tracks the temperature and pressure inside the container to prevent the tampering of the cargo (Lee & Wolfe, 2003). The second mechanism is Total Quality Management that according to Hendricks & Singhal (2001) focuses on three main concepts that aim to improve quality performance: The cost of quality, total customer satisfaction and organisational learning.

Tang & Tomlin (2008) argue, that negative implications of risk events such as supply, process and demand risks can be reduced by adapting mechanisms from the Triple A -supply chain principles developed by Lee (2004). These principles are alignment, adaptability and agility. Alignment that implies a long-term perspective, suggests that a company should align itself with its supply chain partners. Successful companies align the interests of their supply chain partners with their own. Aligned interests are important because all companies try to maximize their own interests. If any company in the supply chain has misaligned interests from the other organisations in the chain, its actions will fail to maximize the chains performance. An example of a company aligning itself with its supply chain partners is redefining their relationship in a way that the companies share risks, costs and rewards proportionately. (Lee, 2004)

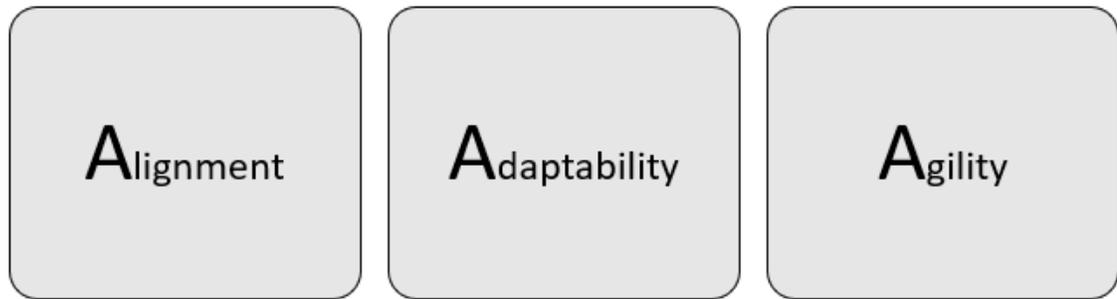


Figure 6: Triple A -supply chain principles (Adapted from Lee, 2004)

According to Lee (2004), companies seldom understand that supply chains face almost permanent changes in markets in addition to unexpected changes in supply and demand. In the era of uncertainty, companies need to redesign their supply chains to adapt to changes in their business environments (Christopher & Holweg, 2011). These changes can be caused by economic and political factors, social change, demographic trends and technological advances (Tang & Tomlin, 2008; Lee, 2004). Therefore, if companies cannot to adapt their supply chains they might not stay competitive in the long run. Lee (2004) suggest that building an adaptable supply chain requires two key components: The ability to spot trends and the capability to change supply networks. In addition, they must ensure that they have an option to alter supply chains. Examples of adaptability can be creating flexible product designs and using intermediaries to develop new suppliers and logistics infrastructure. (Lee, 2004)

Supply chain agility enables a company to mitigate the effects of short-term changes in supply and demand (Tang & Tomlin, 2008). Agile manufacturing refers to a new method of manufacturing that aims at providing companies with a competitive edge by producing defect free products and shortening lead times. Agile organisations tend to be flexible and can respond quickly to market changes by leveraging the intellectual power of their employees. These goals are achieved by increasing the effectiveness of multifunctional product-development teams. These teams are flexible and subject to constant change. Information flows uninterrupted in these organisations allowing integration in functional areas. In addition, these organisations look beyond their cross functional teams to pursue market opportunities in new areas. Management in these companies aim to recognize their

weaknesses and find new ways of overcoming these weaknesses such as cooperation within the supply chain and even with competitors. (Hormozi, 2001) This is more important today because supply and demand fluctuate more than ever. Methods of applying agility can be: promoting information flows with members of the supply chains, preparation by designing contingency plans and developing crisis management teams. (Lee, 2004).

Juttner, Peck & Christopher (2003) adapt Miller's (1992) five strategies of mitigating risk and apply it to a supply chain risk management context. Four of these strategies can be applied to a supply chain context and these strategies are: Avoidance, Control, Co-operation and Flexibility. These mitigation strategies are visible in Figure 7. Uncertainty avoidance occurs when companies decide that the level of risk associated with that market is unacceptable. If a company is already operating in a market where the level of uncertainty and risk rises to a level that is not acceptable a company can avoid that risk by divesting from that market. On the other hand, if a company has not yet entered a market with high uncertainty it can postpone its entry until the uncertainty of those markets decrease to acceptable levels. (Juttner, Peck & Christopher 2003; Miller, 1992)



Figure 7: Risk mitigating strategies adapted from Juttner, Peck & Christopher, 2003; Miller, 1992.

According to research results from Juttner, Peck & Christopher (2003), control is one of the most common mitigation strategies available. Methods of control can include vertical integration, increased stockpiling, use of buffer inventories, maintaining excess capacity in productions, storage, handling and/or transport (Juttner, Peck & Christopher, 2003). However, some risks can be beyond the influence or control of companies. These risks arise from events such as natural and political disasters or major macro economical shifts (Chopra & Sodhi, 2004). The ability to take control of their supply chain can be a contributing factor for achieving supply chain confidence. It is common that even if the company has visibility of a supply chain and is made aware of some sort of information such as demand changes, the company might not be able to make the changes necessary to adjust to the information. The suppliers might not be flexible enough to respond to the changes or the company's production line is too inflexible or production schedule changes are not possible. The inability to respond to changes in demand or other information, might result in the company missing out on a market opportunity. (Christopher & Lee, 2004) Control approaches help reduce variability and dynamic distortions such as the bullwhip effect in supply chains. The main objective of control approaches is to reduce costs and improve profitability in stable environments. However, in volatile environments control can result in rigidity in supply chains and this rigidity can enhance variability instead of dampening it. (Christopher & Holweg, 2011)

According to Soosay & Hyland (2015), modern supply chains operate in increasingly dynamic environments, characterised by globalisation, rapidly evolving technologies and increased customer responsiveness thus, more integrative and collaborative efforts are required. Contrarily to control measures, co-operation comprises of joint-agreements instead of control over the supply chain with the aim of decreasing uncertainty (Miller, 1992). Co-operation can be used as a mitigation strategy in a supply chain context to establish joint agreements with supply chain partners to improve supply chain visibility, understanding and sharing information about potential supply chain risk sources and to prepare joint contingency plans (Juttner, Peck & Christopher, 2003).

The terms co-operation and collaboration are often used interchangeably in management literature. However, Singh & Power (2009) argue that co-operation occurs when companies exchange basic information and take part in some long-term relations with multiple suppliers and/or customers. Collaboration on the other hand, goes further and is characterised by a higher level of commitment, trust and information sharing (Soosay & Hyland, 2015). In addition, collaboration is not limited to supply chains but its benefits can be appreciated by utilising collaboration in an inter-functional setting within a company. Collaboration between functions or departments combine the skills and resources of different departments to achieve a larger organisational goal. (Ashkenas, 2015).

Table 2 describes key collaboration activities that companies can implement in their supply chains and within their own organisations. Information sharing is a central part of day to day operations and strategic collaborative activities. The information shared with collaborative partners can be for example, data used in forecasting such product demand, materials requirements and inventory levels. (Min et al. 2005) Supply chain partners can benefit from the exchange of demand information and action plans to align their forecasts for capacity and long-term planning. Taking a customers, such as a retailers, sales information into consideration when making forecasting is a considerable improvement over relying on customer orders. Holweg et al. (2005)

Key Collaboration Activities	
Information sharing	<ul style="list-style-type: none"> • Forecasting (customer demand, Materials requirements)
Joint Planning	<ul style="list-style-type: none"> • Marketing planning • Production capacity and scheduling • Mutual sales and performance targets • Budgeting • Prioritizing goals and objectives
Joint problem solving	<ul style="list-style-type: none"> • Product development/redisign • Logistics issues (shipping, routing, backhauling, pallet size, packaging, etc.) • Quality control
Joint performance measurement	<ul style="list-style-type: none"> • Performance reviews on a regular basis • Measuring KPI (inventory carrying cost, lead time, customer service, etc.) • Cost-benefit analysis (inventory carrying cost, lead time, customer service, etc.) • Determining rewards and taking corrective actions
Leveraging	<ul style="list-style-type: none"> • Resources and capacity • Skills and knowledge • Specialization

Table 2: Key collaboration activities (Adapted from Min et al. 2005)

Joint planning refers to actions that the companies in collaboration do with information that is shared. Joint planning can co-align the company's operations and capacities. There is evidence from the food industry of manufactures involving retail companies in the strategic planning process where joint goals can be prioritised. Joint problem solving often is accomplished through cross functional teams or co-locating each other's personnel. It involves working together to solve supply chain problems. Examples of problems being solved can be related to product development, logistics issues or quality control. Collaboration can lead to joint performance measurement which ensure and monitor the success of collaborative efforts. Companies in collaborative supply chains can take advantage and benefit

from resources, capacity, skills, knowledge and specialisation of other member of the chain. This exposes the company to more capabilities without having to invest in them themselves. This benefiting from other resources is called leveraging (Min et al. 2005)

Supply chain flexibility is regarded as a key solution to growing uncertainties and competitiveness in the market. Studies have shown how supply chain flexibility contributes to better business performance when facing uncertain environments. (Sreedevi & Saranga, 2017) Flexibility can be implemented in different areas of the supply chain to reduce the negative effects of supply, process and demand risks. Tang & Tomlin (2008) suggest flexibility strategies that can reduce the magnitude of supply chain risks. The first of these is applying a flexible supply strategy by sourcing from multiple suppliers. The company has more supply flexibility as the number of suppliers increases. The second of these is a flexible process strategy that is achieved by flexible manufacturing. In this strategy a company achieves flexibility by shifting production quantities across internal resources. For example, a company's manufacturing becomes more flexible if it can produce products at multiple locations. The third strategy, flexible product strategy by postponement allows a company to delaying production until a customer's order is received. The fourth strategy is a flexible pricing strategy that utilises responsive pricing to influence customer demand. This strategy can be useful when a company has production issues with one product and can lower prices of another product to shift demand from one product to another. (Tang & Tomlin 2008)

Supply chain risks	Strategies to achieve flexibility	Underlying mechanisms
<ul style="list-style-type: none"> Supply risks 	<ul style="list-style-type: none"> Flexible supply via multiple suppliers 	<ul style="list-style-type: none"> Shift order quantities across suppliers
<ul style="list-style-type: none"> Process risks 	<ul style="list-style-type: none"> Flexible process via flexible manufacturing 	<ul style="list-style-type: none"> Shift production quantities across internal resources (factories)
<ul style="list-style-type: none"> Demand risks 	<ul style="list-style-type: none"> Flexible product via postponement Flexible pricing via responsive pricing 	<ul style="list-style-type: none"> Delaying production until customer order is received. Shift demands across different products.

Table 3, Strategies to achieve flexibility adapted from (Tang & Tomlin 2008)

The concept of visibility is sometimes used interchangeably with information sharing (Swaminathan & Tayur, 2003). Barrat & Oke (2007) argue that information sharing is the activity and visibility is the potential outcome of the activity. In addition, that potential visibility may lead to a more effective supply chain. According to Barrat & Oke (2003, 1220) visibility can benefit a supply chain in several ways. Improved responsiveness, improved planning and replenishment capabilities, improved decision making, and improved quality of products are among the benefits of visibility (Barrat & Oke 2003).

The time in which materials flow from one end of the supply chain to another contributes to supply chain confidence. This is especially the case when those times are long. Lack of visibility within the pipeline is associated with pipeline length. Therefore, a member in one end of the supply chain might not have knowledge on events occurring on the other end of the supply chain. An example of this kind of knowledge can be inventory levels, demand, forecasts or order statuses. The key way to improve supply chain visibility is sharing information among supply chain members. Sharing of information has been shown to reduce uncertainty and thus resulting in a more responsive system that is based on demand instead of forecasts. (Christopher & Lee, 2004) A company's ability to respond to end customer demand has been a source of competitive advantage. When each member of the supply

chain directly utilises market sales information it improves their speed of response and reduces phenomena like the bullwhip effect. (Mason-Jones & Towill, 1997)

Business interruption insurance is tool for transferring business disruption risk. BI insurance offers firms a financial mechanism for managing their exposure disruption risk (Dong & Tomlin, 2012). It can help the affected company to resume its normal operations and attain the same profits enjoyed before the disruption event (Zhen et al. 2016). According to Skees, Botts & Zeuli (2001), insurance companies offer insurance policies even for major incidents such as product recalls. These insurance products can cover direct recall expenses such as publicity, transportation, disposal and replacement and even indirect expenses for instance third party expenses, loss of profit and business interruption. Third party expenses refer to lost profits of downstream partners such as retailers.

When researching incoterm use in risk management it becomes quickly apparent that there is a shortage of literature in the area. Even though incoterms are referred extensively in management literature their use has been virtually ignored despite their strategic importance (Gooley, 2000). The term Incoterms derives from “international commercial terms” and refers to rules proposed by the International Chamber of Commerce (Hien et al. 2009). These rules define who is responsible for transport costs, when is the risk or ownership of the goods transferred from seller to buyer and who is responsible for export formalities (Jimenez, 1998). The use of incoterms are not obligatory but are regardless recognised by governments, transportation professionals and legal authorities. According to Hien et. al. (2009) there is not enough knowledge on incoterms that is why the selection of the most suitable incoterm has been difficult for companies. Table 4 visualizes the different costs and responsibilities in all of the incoterms presented in Incoterms 2010.

Incoterm/ Cost	EXW	FCA	FAS	FOB	CFR	CIF	CPT	CIP	DAT	DAP	DDP
Loading from warehouse	B	S	S	S	S	S	S	S	S	S	S
Pre-carriage	B	S	S	S	S	S	S	S	S	S	S
Export customs clearance	B	S	S	S	S	S	S	S	S	S	S
Handling at departure	B	B	B	S	S	S	S	S	S	S	S
Main transportation	B	B	B	B	S	S	S	S	S	S	S
Transportation insurance	B	B	B	B	B	S	B	S	S	S	S
Handling at arrival	B	B	B	B	B	B	B	B	S	S	S
Import customs clearance	B	B	B	B	B	B	B	B	B	B	S
Post-carriage	B	B	B	B	B	B	B	B	B	B	S
Unloading into warehouse	B	B	B	B	B	B	B	B	B	B	S
S: Costs paid by the seller											
B: Costs paid by the buyer											

Table 4: Different costs and responsibilities of Incoterms 2010.

3 RESEARCH METHODOLOGY AND DATA COLLECTION

This chapter discusses the research methodology of this thesis. The chapter begins by explaining what research method is used and goes on to discuss how the data was collected and analysed. Further on, this chapter will discuss how this thesis fills the research gap in the literature and acknowledges what kinds of limitations it has.

The research method of this thesis is qualitative case study. Case studies are used to research detailed, intensive information of singular events in which material is usually gathered by interviews (Hirsjärvi et al. 2010). Single case studies give researchers the opportunity for deep observation. In addition, case studies have their limitations such as the lack of generalisability and exaggeration of easily available data. (Voss et al. 2002) The case study is exploratory in nature and is used to find new points of view and study phenomena of supply chain risk management in dairy industry exports.

3.1 Data collection

The primary data used in this thesis will be gathered by means of semi-structured interviews with the aim of answering the research questions. Interviews took place at the case company where professionals who are responsible of strategic and operational responsibilities in consumer exports to the export markets in the United Kingdom, Poland and Spain were interviewed. Interviews were based on risk

categories that were based on the theory. During the interviews, these risks were approached one at a time and the structure of the interviews were loosely structured. If the interviewees were not familiar with the risk category the interview would proceed to the next category. This was due to different interviewees were focused on different areas of the export supply chain. Mitigation methods, that were an important part of this research were discussed in the interviews after identifying risk sources of the export supply chain. All of the interviews took place at the company headquarters and audio was recorded by smart phone.

Other materials used in this thesis are scientific publications such as journals and textbooks in the researched field. These publications will be used to gather information for the literary review and theory parts of this thesis that will be used as a framework for this study. The semi-structured interviews will be based on this framework. Table 5 visualises the interviews, jobs titles, experience, market focus and interview durations.

Interview Number	Job title	Experience	Market focus	Interview Duration
No 1.	Technology sales manager	In industry since 1984	International	41 min
No. 2.	Sales Manager	In the industry since 2000	Europe	70 min
No. 3.	Export Coordinator	In the industry since 1996	Poland	36 min
No. 4.	Export Manager	In the industry over 10 years	Spain	50 min
No. 5.	Export Manager	In the industry over 5 years	Poland	30 min
No. 6.	Export Coordinator	In the industry 2 years	Spain & UK	40 min
No. 7.	Risk Manager & Insurance Specialist	15 years & 9 years at the company	International and domestic	55min
No. 8.	Transportation Manager	40 years in the industry	International & Domestic	30min

Table 5: Interviews conducted at the case company.

The interview structure was based on seven risk categories that were derived from the theoretical part of this thesis. This categorisation could have been different, but this choice was made by the author with the aim of creating broad categories for risks identification. Supply, operational and organisational, demand and security risks were directly derived from the theory from authors such as Manuj & Mentzer (2008) and Juttner, Peck & Christopher (2003) and were an integral part of the interview structure. Environmental risks were a category which was a central part of the theory section but was not part of the interview structure. However, several environmental risk sources could be identified from the data and these findings were gathered under the category. Based on the preliminary meetings with the case company, it became apparent that transport risks sources and financial risk sources were risk sources that would be central to the research. These categories were not

directly categorised in the theory but were present there and added to the structure to dig deeper in these areas. The risk categories are visualised below in figure X.



Figure 8: Thesis risk categories

3.2 Data analysis

Qualitative analysis consists of two parts: simplifying observations and interpretation of observation. Simplifying observations refers to treating the observations from the interviews only in the context of the framework of the thesis. This is because observations can be analysed in several different ways and keeping the research within the framework ensures that the analysis stays within the context and does not stray into other areas of research. Interpreting the observations from the interviews relates to how the observations are interpreted to find answers to the research questions. The two concepts are closely related and can be at times appear interchangeable. (Alasuutari, 1993)

The process of data analysis started by transcribing the interviews from audio to text format. After this transcription, the interview content was categorised under the risk categories mentioned earlier. This was because the interviews often jumped from one category to the other and sometimes interviewees revisited categories discussed earlier on in the interviews. Because seven of the eight interviews were in Finnish the categorised transcripts had to be translated into English. After this translation all of the translated transcripts of each interview were moved to a new document that had all of the data from all of the interviews under the risk categories. After this phase, connections were drawn from the data and summarised in the empirical chapter of this thesis with the intent to answer the research questions.

3.3 Research gap and limitations

From the literature review a conclusion can be drawn that there is extensive literature on supply chain risks and supply chain risk mitigation. However, studies that are focused on the dairy industry and consumer products are limited. This thesis fills this gap by bringing risks and mitigation methods to the dairy industry export supply chain context. Special characteristics of exports in the dairy industry include that exports are of a perishable nature and temperature sensitive.

This research is limited and focused on dairy exports from the point of view of the exporter company. Thus, this study cannot be applied to all supply chains in general. In addition, this study focuses on the export side of the supply chain. Meaning that it is focused on the supply chain from the factory to the end customer.

This thesis is limited to consumer products that are transported in temperature sensitive supply chains that are necessary to ensure high quality from the factory to the end customer. The export markets are limited to the United Kingdom, Poland and Spain and products are sold to customers at grocery chains at their intended destinations.

4 SUPPLY CHAIN RISK IDENTIFICATION AND MITIGATION IN CASE COMPANY

4.1 Case company background

This chapter discusses the background of this qualitative case study. It will provide a brief background of the case company and provide insight why and how this area of study will be an import addition to existing literature on supply chain risk management in export supply chains in the dairy industry.

The case company in question is a dairy company operating in Finland. The company is one of the largest food exporters in Finland and has been exporting ingredients for the food industry along with consumer products for decades. More recently, the company has been focusing on exporting consumer products. This case will focus on the consumer product exports to countries such as the United Kingdom, Poland and Spain. The company's infrastructure in these countries typically consists of a third-party company or distributor that handles logistics, warehousing and sales. These third-party companies then forward these products to grocery chains. The products are shipped to their intended export markets from the factory in Finland through Europe by refrigerated trucks. Due to the third-party company in charge of logistics and warehousing at the intended destinations there has been concern over who is responsible of the products during transportation and warehousing.

According to the company, having a supply of products to meet demand is one of the most essential parts of this operation. Competition on the shelves of grocery chains is intense and failures to meet demand could have serious consequences on brand value, customer satisfaction, profitability and overall outlook of the business. Therefore, disruptions in the supply chain, for example a loss of a shipment due to realized export disruptions, can have consequences beyond the value of the products.

4.2 Supply risks

This chapter will analyse the data that was extracted from the interviews regarding supply risks. In the interviews it became apparent that some supply risks could be identified with the company. Supply risks were dependent on what markets and products were involved. Two distinct risk sources for these supply risks could be identified and they are: The procurement of packaging or containers for consumer products and procurement of ingredients for market specific products.

In the interviews, packaging for products, meaning the package or container in which the product is sold in grocery chains, were identified as a potential risk in the company's export supply chain. There were several qualities of the packaging requirements that caused packages to be a source of supply risks.

First, the supplier from which the company procures the packages has long lead times. Lead times for new packaging could be as long as four months and this meant that the company had to pay special attention that they had enough packaging to cover their sales. Forecasting demand was identified as an important method to mitigate these risks. Through proper forecasting with their customers or distributors, the company could predict the amount of packages they would require ensuring they could manufacture the products necessary to meet demand.

“Packaging can have lead times up to four months, which makes forecasting all the more important.”

- Export Manager

Second, an added element that makes procuring packages more difficult is the fact that different markets have different requirements for packaging. Local language, certification stamps, allergen descriptions, national regulatory requirements and country specific marketing are requirements that make different packaging necessary. The company has put in place mitigation measures that aim to make forecasting and procurement of packages easier in the future. New packages for a product that is aimed at Polish and Spanish markets have the requirements of both

countries in their packaging. They have descriptions of the product in both languages and in English. This will allow the company to use the same packages for both Polish, Spanish and other possible new markets the company might be prospecting. Stockpiling has been a method of mitigation for the company in the case of packaging, part of the stock is held in the case company's storage and the rest at the suppliers. When the volume of sales increases and becomes more predictable, procurement of packaging becomes easier. For now, stockpiling has been a solution that has worked for the time being.

There have been instances where these long lead times have caused issues with customers for example in the case of private label products. Private label products are products that are manufactured by the company but use a brand of the customer. If the customer that buys these products wants to change the packaging for their product they would have to wait for up to four months for the change to take effect. The company makes sure that this information is known by customers in the beginning of a business relationship. Thus, making lead times known to customers and avoiding unwarranted surprises.

Other elements of packaging that contribute to supply risk include, that consumers in different markets have different preferences regarding packaging sizes. An export manager gave an example: "In the United Kingdom yoghurt can be sold in 400g packages but in France, consumers prefer smaller packages in multipacks. These are things to consider when planning production and sales to markets." In addition, packages have a best before date that means the packaging cannot be used in manufacturing after a certain amount of time. This is an additional factor that must be considered while forecasting.

Identified supply risks are not limited to procurement of packaging. The company has products that are manufactured specifically to a single market. This means that the product is not sold in other markets and makes the procurement of the ingredients for these products suboptimal. This is partly the consequence of the company having to procure these products specifically for one product and cannot use these ingredients for other products. The minimum quantity of some of these

ingredients procured is much larger than the required amount that is used for sales and these ingredients cannot be used in other products because they are specific to this product. This has caused issues because the company aims to use ingredients as efficiently as possible and aim at maximizing their best before date.

“Taking risks and being flexible is necessary for success in the early stages of market entry”

The company has been optimizing this system for a sometime. However, due to a large organisation and long lead times from supplier’s, decision making is seen as being too slow and not flexible enough. This is partly the cause of not wanting to take too much risks in consumer markets. According to views of one of the managers, the company must take risks and be more flexible to succeed with consumer products at export markets. However, this is the case in the early stages of market entry. Several of the interviewees stated that supply risks are likely to be mitigated as the volume of sales increases.

4.3 Operational or Organisational risks

This chapter analyses the operational or organisational risks that were identified from the interviews in the case company. Operational and organisational risks were combined in the interviews under the same theme because they are both risks that arise from within the organisation itself. Several risks arising from the organisation’s operations could be identified. Profitability in early stages of market entry, cost structure, competitiveness of the grocery chain retail market and distributor capability were among the main risks that could be identified.

“In the beginning of market entry there are investments that must be made and the company must be able to be flexible and produce smaller quantities than it is used to.”

- Export Manager

Manufacturing at factories is designed to produce higher volumes than ones that are currently sold to export markets. In the early stages of entering a market there are issues with small sales. Sales are relatively small compared to minimum manufactured batch sizes. This results in excess products left over from production. Just as the case with supply risk in the previous chapter, market specific products must be manufactured separately. Procured ingredients that are used for market specific products may go partially unused because of minimum purchase quantities. Costs of these ingredients fall on top of that products cost structure. Making it unprofitable in the short-term. With products that are sold domestically and to other markets, there is no such issue. The manufacturing of these products can be combined thus making costs lower due to higher in use capacity. This has been a strategic decision in new markets that products that are meant for exports are not as profitable as domestic or established export market products. In the beginning of market entry there are necessary investments and the company must be able to be flexible and produce smaller quantities than it is used to. Currently, the company has been able to use leftover products for promotional and marketing purposes. This has been a short-term solution that has attracted interest in the company's products. However, this is not seen as a long-term solution.

Cost structure is challenging because costs in Finland are higher than European countries on average. Company's focuses on "premium" high quality products in export markets. The company's products are among the most highly priced in the markets and even at this price the volume of sales must be high because of manufacturing is designed for large quantities. The company cannot compete with regular product ranges. In addition to production costs, logistics costs are expensive. The company aims to mitigate these costs by being as effective as possible in logistics operations for example sending full truckloads.

"If a company desires to get their products into grocery chain X they must be in grocery chain A for at least one year first. They must be able to sell and deliver products to fifty locations for one year and prove their capability"

- Export Manager

The competitive environment of the grocery chain retail market puts the organisations operational capabilities to test and exposes the company to several risks. Grocery chains have conditions for manufacturers for getting their products on their shelves. For example, a grocery chain in the United Kingdom has requirements that a seller must work with a third-party distributor for at least 12 months before the seller can deliver products directly to the chain. The environment is challenging in Spain as well. There is a hierarchy with certain steps to take if a company wants to sell its products in a grocery chain. If a company desires to get their products into grocery chain X they must be able to sell and deliver products to grocery chain A for at least one year. They must be able to sell and deliver products to fifty location for one year and prove their capability. These steps cannot be bypassed. The competition for shelf space is intense and every product that is in shelves must “fly off shelves”. However, when a company can prove their capability and establish their brand in a grocery chain they do not have to repeat these steps for other products.

There is risks involved with these steps because failure to meet the requirements for these grocery chains may result in loosing that place on the shelves and it might be difficult or even near impossible to get it back. Therefore, operational capabilities such as delivery success and meeting the customers’ requirements plays a crucial role in market success. The weakness of the company is that it doesn’t have enough products ready to replace the ones that might not be competitive. For example, if a product is not selling well, the company should have a product ready in the pipeline to replace it along with packages suitable for the market. At the time of the interviews, the company was considered to be too inflexible to deliver new and replacing products.

“In a market like Spain there must be a distributor as a partner because of the culturally sensitive nature of consumer food.”

- Export Manager

According to the experience of the export managers of the company, distributors are at times necessary to sell products successfully at export markets. One

indication of the importance of distributors is that all the three export supply chains studied in this thesis used distributors. In Spain for example there must be a distributor because of the culturally sensitive nature of consumer food and their knowledge of the characteristics of local commerce. There had been interest of supplying the grocery chain directly. However, the grocery chain prefers to work with distributors.

With distributors control and visibility of the supply chain is limited. The more partners there are between the company and the customer the more risk there is. The company had an unsuccessful relationship with a distributor that highlights what kind of issues a company can face and how much risk can be exposed because of a distributor. The company was appointed a distributor as a condition to supply a leading grocery chain in the country. After some time, the distributor announced that it was discontinuing their temperature sensitive business. This made the company search for a new distributor in the country and they found one that appeared suitable on paper. The arrangement was that the distributor handled logistics and supplied grocery chain locations. In addition it handled communication with the grocery chain. However, it became apparent that the distributors experience with short shelf life products were limited and they did not have the capabilities that were necessary for the operation.

“The amount of waste the company had considered in their pricing was a standard few percent. However, the distributors waste of our products was almost ten times that”

- Export Manager

The problem was that there was not an IT-system that was compatible with the grocery chain, distributor and the case company. This meant that Export Coordinators had to input orders manually which exposed the company to risk because the possibility of an error was high. In addition, the distributor did not keep the company updated on inventory levels in their warehouse. Another problem was that because of inefficient warehousing, the amount of waste was nearly ten times the amount expected. This made the business unprofitable. Additionally, there was

issues with payments and who was responsible for the waste generated by the distributor. In the end the company decided to end the relationship with the distributor.

4.4 Environmental risks

This chapter analyses risk that arise from the environment that were identified from the interview data. Environmental risks were not part of the interview structure. However, four risks that clearly stemmed from the environment were identified and these were: Refugee crisis, Brexit, competitive environment and strikes and labour disputes.

In recent years there has been noticeable rise in stowaway incidents in the company's transportation. These incidents occur when people attempt to cross national borders by braking into cargo that is on route to another country. The cases that were discussed in this thesis were reported to the company by customs that are the main governmental body that oversees surveillance at borders. According to the interviews, these risks are hard to mitigate because these events are isolated and rare. Mitigation methods identified were insurance and corrective actions by transportation companies.

The ongoing Brexit negotiations are an example of uncertainty caused by a possible exit by the United Kingdom from the European Union. Brexit was a contributing factor for the company to withdrawal from the United Kingdom. Worst case scenarios were 43 percent tariffs for dairy product which would be a major risk if realised. The company's products are in the high-end category when pricing is considered, and a 43 percent tariff would push the products price beyond the consumers willingness to pay. The interviews discovered that there is no official policy for mitigating political risks.

The competitive environment can be identified as a potential risk. When the company is in markets such as Spain and the United Kingdom it is competing with

major international corporations and local companies. There is a significant difference between Spain and Finland regards to competition in the grocery chain sector. Finland has approximately 3 major companies and in Spain there are 20 to 30 grocery chain companies operating in the markets. Proposed ways to mitigate the competition are that the company must be flexible and be able to have products in the pipeline to replace underperforming products.

Labour disputes or strikes are risks that the company must consider. According to the interviews it is difficult to prepare because products have a short life cycle meaning that mitigation methods such as stockpiling are out of the question. In addition, there is the possibility that products stuck in transit to their destination in a terminal because of a strike. Transportation companies are ultimately responsible for the costs that occur when products are spoilt during transit up to a certain amount.

4.5 Transport risks

This chapter analyses transport risks and their mitigation methods that could be identified from the interviews at the case company. Several transport related risks could be identified. Stowaways in shipments, labour strikes, equipment malfunctions and others were among the transport risks that could be identified. In addition, insurance, logistics tests and incoterm selection were among mitigation methods in use by the company.

One of the major risks that could be identified were incidents where stowaways had broken into shipments. Interviews revealed that stowaways have become a growing concern for companies transporting goods in the European Union. There have been incidents in the past but there has been a clear increase in incidents in recent years. The typical process of how these incidents come to the company's attention is when customs officials at the country where the stowaways are discovered notify the company of the incident. Then there is an investigation to where the stowaways have entered the vehicle. This is made possible by the transportation company's temperature tracking. After the investigation is over, the company must arrange the

goods to be transported to a place where an insurance inspector can check the cargo. In all the incidents with stowaways that were discussed the products were rendered unfit for sale.

“There have been incidents in the past but there has been a clear increase in incidents in recent years”

According to the interviews, the mitigation of these incidents is for the majority part the responsibility of the transportation company and customs officials. However, corrective actions were enacted with the transportation companies such as: Truck drivers cannot stop at any given location for their mandatory brakes but must park the vehicle in a location where the doors can be seen by surveillance cameras. After the driver returns, he or she should check that the seals on the doors are intact to ensure the integrity of the cargo. The company mitigates these risks with insurance. After these recent incidents occurred insurance policies have been adjusted with insurance companies. In addition, the interviewed stated that possible force majeure -clauses could prepare customers and distributors for such events. Direct and indirect costs are high for these incidents. Direct costs consist of the loss of cargo and indirect costs the loss of sales and damage to the brand. These risks are considered in the interviews as rare but severe.

More common risks in the company's export supply chains are vehicle and equipment malfunctions. For example, there has been cases where the products have been in a vehicle and temperature control machinery has stopped working. Thus, resulting in the cargo being rendered useless. Other examples are vehicle brake downs and single pallets being lost in a logistic terminal when they are waiting to be shipped. These kinds of incidents are the responsibility of the transportation companies. The case company has developed procedures for terminals, transportation companies and factories where vehicles are checked before loading to ensure that they are up to standards. Real time temperature control data is used to pinpoint where possible issues have occurred and to find who is responsible for the damage. In addition, export coordinators have first-hand knowledge on the

capabilities of different transportation companies so that they can choose the best possible company for each location.

“Typical risks in transportation often involve vehicle malfunctions or the disruption of the cold chain.”

The company has some products that are prone to damage during transport. For example, there is a product that is layered, and these layers cannot be mixed otherwise the product would not be as attractive to customers. Therefore, when company got notice that some of the products were mixed during transport they underwent logistics tests that involved checking products in different parts of the export supply chain to pinpoint where the mixing had occurred and to implement mitigation measures. These logistics tests are conducted with new products to prevent these kinds of events from happening.

There are other risks in transportation that could be identified. One of these occurrences originates from a distributor who buys products from the company with FCA-incoterm and had a history of picking up the products on schedule. The company mitigated this risk with a distributor agreement that imposed penalties on the distributor if they did not pick up the products after an agreed amount of time. Other issues involved courier services that the company uses to send samples to customers and potential customers. These deliveries are temperature sensitive and must be delivered overnight for the quality to remain intact. Different courier services have fell short of their promised delivery and there have been incidents where packages have been lost. Costs of these losses easily compensated. However, greater damage is done if the customer does not get their sample. No mitigation measures were identified for this issue.

4.6 Demand risks

In this chapter analyses the demand risks that were identifiable from the interviews at the case company. Variety of demand related risks could be identified. The most emphasised of these risks were risks that were related to forecasting of demand, budgeting of demand and the fluctuation of demand. The main mitigation method for demand risks were the initiation of production only after orders were finalised. This method could be identified in six of the eight interviews. Other mitigation methods included distributor agreements and imposing penalties for braking the conditions of these agreements.

“When the volume of the business grows, forecasting gets better and basic demand planning issues are mitigated. However, the increase in volume brings other issues such as the cost of making mistakes grows greater.”

According to the interview's, forecasts are the basis for procurement of ingredients and packaging materials. Risks materialises when orders are smaller than forecasts. Especially in new markets and new environments there are greater risk that forecasts are not accurate. According to the interviews, it is typical that sales volumes are overestimated, and realised orders are smaller than predicted. In addition, it is difficult to make forecasts in new markets and with new products. If data is received from the customer forecasts are easier to make and contrarily, are difficult if information does not flow properly. During the interviews, an example of a distributor not delivering necessary data to the company. After attempts to better the flow of information between the companies. They decided to amend the distributor agreement so that penalties would be imposed if required documentations were not delivered. In addition, it was stated that when the volume of the business grows, forecasting gets better and basic demand planning issues are mitigated. However, the increase in volume brings other issues such as the cost of making mistakes grows greater.

While comparing budget and realised sales, the company has noticed a significant increase in sales, but remains behind budget. While making the budget it was

predicted that there would be more products coming up the pipeline to these markets, but progress has been slower than expected. They base budgets on data from past experiences from other markets. Issues emerge when they do not have data from new markets. Even data from one grocery chain might not be comparable with another. Things might not follow the same patterns. Grocery chains in Spain for example, have differences on how they operate, some are local and others international. Systems rely on forecast that are based on data. The earlier the company gets information about future orders the easier it is to plan production and transport. The sales person is always thinking about flexibility and customer satisfaction. Coordinators keep the customer in mind when coordinating production and transportation.

Demand fluctuation was dependant on the product in question. Other products were predictable but for others there were lots of fluctuation. If there was an increase in demand the company did what they could. Lead times are still strict. Factors such as competing products having sales decreased demand and similarly the case company's own promotions increased demand. These were factors that had to be considered when planning for demand.

Internal processes are seen complicated and production itself takes approximately one week. This makes being flexible more difficult. Some products are more flexible than others. Production of some products can be combined with products to other markets. However, others cannot and production has to separate. In addition, some factories have more export experience and therefore are more capable of being flexible.

Distributor behaviour was found to be a contributing factor to demand risks. A case where a distributor tried to change volumes even though volumes were already agreed upon. The case company tries to be flexible and keep customers satisfied, but it is difficult to be flexible with lead times. Other issues with this distributor included variation in which unit the orders were placed. The units ranged from kilo, package and pallet even though a unit of sale was already agreed upon. These kinds of issues might appear to be insignificant, but they were perceived as

unnecessary and time consuming. There had been attempts to mitigate these issues, but they had not been resolved at the time of the interviews.

Exports of consumer products differ from ingredient sales. For example, consumer products have more unexpected orders. This is typical for new markets new business and the company tries to be as flexible as possible. In the long run, the interviewed managers conclude that demand should be more predictable. If there is large potential with the customer, they will try to be as flexible as possible. Contrarily, if there is not much potential in the relationship they will tend to be less flexible. However, lead times are strict and made clear to customers.

The interviews showed that the main mitigation method for demand risks is that the company does not initiate production of products before the orders are finalised. This was the most prominent mitigation method identified from the interviews. Six out of the eight interviews stated this method. The reason for initiating production of products only after orders are finalised was due to small volumes.

4.7 Security risks

This chapter analyses security risks that were identified in the empirical research. Two distinct security risks could be identified from the data: Cargo breaches by stowaways and intellectual property risks. Several mitigation methods could be identified: Logistics provider selection, cargo integrity measures, contractual mitigation of intellectual property risks were the among the most prominent mitigation measures identified from the data.

The issue of stowaways in truck shipments has been mentioned before in the transport risks chapter of this thesis. This risk has been described in transport risk section of this thesis along with mitigation its measures. However, based on Manuj & Metzger's (2008) categorisation of security risks, stowaways can be considered in this category.

Intellectual property risks were among the risks identified from the data. The company has experience of selling private label products to customers. Private label products are products of the company that are sold under a customer's brand. In these situations, the customer is given the specifications and recipe of the product. The company protects their intellectual property by contractual means. Contracts in these business relationships state that the customer cannot sell the recipe to anyone. According to the interviews, the company was more exposed to intellectual property risks in private label products than products that were under the company's own brand. This is because products that have their own brand are sold to customers with just the specifications of these products not the recipe. Specifications state the contents of the products such as fat, protein and sugar. When a customer buys a product only information dictated by law is handed over and non-disclosure agreements are commonplace in business relationships. This enables the company to contain and manage its trade secrets.

With some products the technology used in manufacturing is so complex that it would be hard to copy products without the technology licence. Some products are one of a kind and do not have similar products competing on the market. However, there is always the risk that competitors start making a similar product even though it is not necessarily considered copying. If there is not competing products on the market, it is just a matter of time that there will be.

4.8 Financial risks

Financial risks that were identified from the interviews are analysed in this chapter. Most of the interviews on financial risks gravitated to themes such as customer credit and payment terms. Financial risks that were related to the success or failure of export projects were also identified. In addition, mitigation measures for identified financial risks were discovered.

“New markets exposed the company to several new risks that are hard to estimate in advance.”

In the interviews financial risk that relates to success or failure in export markets was identified. New markets exposed the company to several new risks that are hard to estimate in advance. Entering and succeeding in a market demands significant funds to achieve. However, funds that are invested into entering new markets are lost when exports operations are seized or result in failure. According to the interviewed, it is up to the sales organisation to consider the risk that the company is exposed to when they are going into new markets. Careful risk assessment and identification should be conducted. Because the company's history teaches them that the consequences of realised risks do not come cheap.

Financial risk is realised when a customer does not pay. There have been instances where customers do not pay on time. In these situations, the company considers which is more cost effective, negotiation or collecting from the customer. They aim to keep good business relationships with customers and prioritise discourse over conflict. Continuing the relationship is a priority because constantly arguing over late payments may interfere with the goals of the business relationship. However, customers must pay their invoices and continuous failures to pay invoices may result in a last resort effort of postponements of future shipments to the customer.

The company's credit surveillance department oversees, reviews and investigates customers credit ratings. New customers often start with a payment term of 100% advance payment or a letter of credit is used. After the new customer has become better known, credit limits can be gradually increased. It is often the case that credit limits must be raised temporarily to continue business. This process takes time, but the alternative would be that future shipments would have to be postponed.

"The most important way to mitigate financial risks are carefully drawn contracts."

In future business a sales manager suggests that they should spend a considerable amount of time in establishing when and where the ownership of the product is transferred: how cash streams work? When are payments made? What is paid? When and who is responsible for occurring costs. In addition, according to another

manager, the most important way to mitigate these risks are contracts. Contracts are drawn based on auditing the distributor or customer. The companies age, financial stability, employees, perceived capabilities and existing infrastructure are among the criteria used to form contracts and decision making.

In the literature credit insurance was suggested as a way of mitigating financial risks. The company does not use credit insurance as a way of mitigation in its export supply chains studied in this thesis. However, the company's subsidiaries use them in other export markets. According to the interviews, credit insurance is country specific and in some export markets it is common practise. Most distributors and customers in the export supply chains did not have issues with payments.

4.9 Incoterm selection

This chapter reviews and analyses incoterm use in the case company. The interviewed were asked how incoterms are used and how they are related to risk management in the export supply chains of the United Kingdom, Spain and Poland. Incoterms were found to be an integral part of risks mitigation in export supply chains. Incoterm selection dictates the responsibilities between the buyer and seller. For example, they determine where risks and ownership of the goods transfer from the seller to the buyer. Identified incoterms that were used in the export supply chains were CIP Carriage and Insurance Paid to and FCA Free Carrier.

The company's interest in incoterms originates from cases where blurred lines of the transfer of ownership of the goods has caused unexpected costs. An example of one of these cases is an export supply chain where the company sold products to a grocery chain in the United Kingdom. The confusion in the supply chain was caused by a distributor in between the company and the final locations. The distributor handled logistics and warehousing in the export market. There were disagreements concerning who was responsible of the goods when they were in the distributors warehouse and it was not clear who was accountable for the costs for waste that occurred at the distributors warehouse. By interpreting the CIP-incoterm

the conclusion could be made that the buyer, the grocery chain, was responsible for the waste. However, it can be concluded based on the interviews that incoterms are not as clear as they appear on paper.

The incoterm CIP dictates that the seller arranges and pays for transport until the destination and insures the cargo on behalf of the buyer. The seller is liable for the risk of the goods until delivering the products to a logistics provider of their choosing. The buyer then covers the risk of the transport. CIP – incoterm means that if there is an incident the buyer claims compensation from the insurance that the seller has taken for the cargo. However, for customer service reasons, the company has taken control of the insurance claims and handles procedures when incidents happen. This has led to discussion about the company switching to D-clause incoterms such as DAT, DAP and DDP, because it would be more in line with the responsibilities that the company has taken thus far. This is considered to clear up past misunderstandings regarding transfer of ownership and risk.

“Because the company does not arrange transportation and is not responsible for the risk, it does not have control over this section of the export supply chain.”

The company uses FCA, Free Carrier -incoterms to Poland. The incoterm states that the seller is liable of the risks until it delivers the goods to the transportation company selected by the buyer. The buyer is responsible for the risks during transportation. This can be thought of a risk mitigation method in a way that the company does not arrange transport and is not liable for risks after the goods are loaded from its warehouse. However, there is another side to the FCA -incoterm. Because the company does not arrange transportation and is not responsible for the risk, it does not have control over this section of the export supply chain. This can result in situations where if there is a quality issue with the product, it can be difficult to determine at which point the quality has deteriorated. The company can only control quality in the supply chain in places where it is responsible for the risks. If there are quality issues it is hard to prove where they have occurred and who is

responsible. Mitigation measures have been taken such as checking temperatures at pre-determined locations to ensure the integrity of the cold chain.

“In business to business sales common sense cannot be relied on. The contract dictates who is responsible.”

Primarily, the company is responsible for the quality of the product even though the incoterm is FCA. There must be a thorough investigation to the root cause of the issues. Consumers have the right to claim compensation directly from the company even as there is a distributor who is responsible for the risk, between the company and the customer. According to the risk manager of the company, in business to business sales common sense cannot be relied on. The contract dictates who, when and where someone is responsible for costs.

4.10 Insurance coverage

This chapter analyses the case company's use of insurance as a way of mitigating risks. The case company's use of insurance was a topic of discussion in the interviews and the interviewed were asked of insurance use at the case company. Answers varied between the interviewed and most of the data used in this chapter originates from the interviews of the transport manager, risk manager and insurance specialist. Insurance matters were not an integral part of the other interviewees. However, their experiences with insurance is included here in this chapter.

“There is a considerable grey area in insurance and it is not always clear who will compensate and what.”

Insurance discussed in the interviews mainly focused around transportation and warehousing of goods. As mentioned before the company prefers to arrange the transportation themselves. This is because they have more control over transports and can understand and learn about different shipments. According to the interviewees the case company has a competitive insurance policy regarding

coverage and costs. Arranging transport and insuring cargo themselves is a strategic choice which simplifies the insurance claim process as all claims can be made by one insurer. If customers and distributors insured the cargo, matters such as insurance coverage and compensation would be out of their control.

There has been a review on the current state of the insurance policy to determine if they benefit the company. An argument exists for not using insurance at all for transportation of goods because transportation companies have taken an insurance policy for their shipments. For example, the company has not taken additional insurance in domestic markets and solely rely on insurance of the transportation companies. However, the company has concluded that insuring cargo themselves for exports is beneficial for the time being.

“The insurance policy aims to claim as few incidents as possible and to maximize the compensation amount of those claims.”

Claiming compensation for damaged cargo is a “balancing act” between the insurance payments and the cost of the damages. The more damages they claim the higher the price of the insurance becomes. Minor damages to cargo are common and happen often. It is not cost effective to claim compensation for all damages. When an insurance claim is made the company pays taxes, deductibles and a processing fee to the insurance company. For example, if there is a hundred euros of damages to a cargo it would be more expensive to claim damages because of the costs of the claim and the time and effort of the work associated to making the claim. They must optimize the fact that insurance costs are greater than damage costs. The insurance policy aims to claim as few incidents as possible and to maximize the compensation amount of those claims.

“The decision-making process is layered. Export and Sales Managers are thinking about key performance indicators and Risk Managers are thinking of risk management of the whole company”

There was concern in the interviews that the risk managers and export and sales managers do not communicate between each other. The decision-making process is layered. Export and sales managers consider key performance indicators and risk managers are considering risk management at a company level. Both parties could benefit from more communication with each other and there is a new model in the works that would add more communication between departments. However, the interviews indicate that everyone focuses on their own work and turn to the other departments only when necessary.

“Insurance is the final defence for risks and is just one mitigation method among others.”

According to the interviews, insurance is just one mitigation method among others and aims at protecting the company of large risks such as completely damaged cargo containers. When doing business, it is important to identify which risks the company is exposed to. Only risks that can be identified can be mitigated. Insurance cannot be the only method of mitigation. Careful planning and pre-emptive decision making is key for mitigation. Contract negotiations are an important point of risk management. Possible difficult situations should be discussed at these negotiations and not only focus on the beneficial sides of business.

4.11 Country Specific Export Supply Chains

This thesis focused on three export destinations: The United Kingdom, Spain and Poland. Interview questions were used to gather information about the export supply chains and their characteristics. In this chapter, these supply chains will be visualised through supply chain mapping. In these maps, different parts of the supply chain will be visualised such as factories, logistics terminals, the transfer of ownership of the products and the risks. In addition, this chapter will summarise identified supply chain risks and their mitigation methods from the interviews.

4.11.1 United Kingdom – Distributer problems and blurred lines of ownership

This chapter describes the export supply chain to The United Kingdom. The export supply chain begins at the case company's factory that produces the products and loads them onto containers that are then shipped by truck through Europe to Calais, France and onwards to the United Kingdom. The distributor stored the products and handles transportation to the grocery store locations. The incoterm used in this supply chain is CIP, Carriage and insurance paid to the grocery store locations in the United Kingdom.

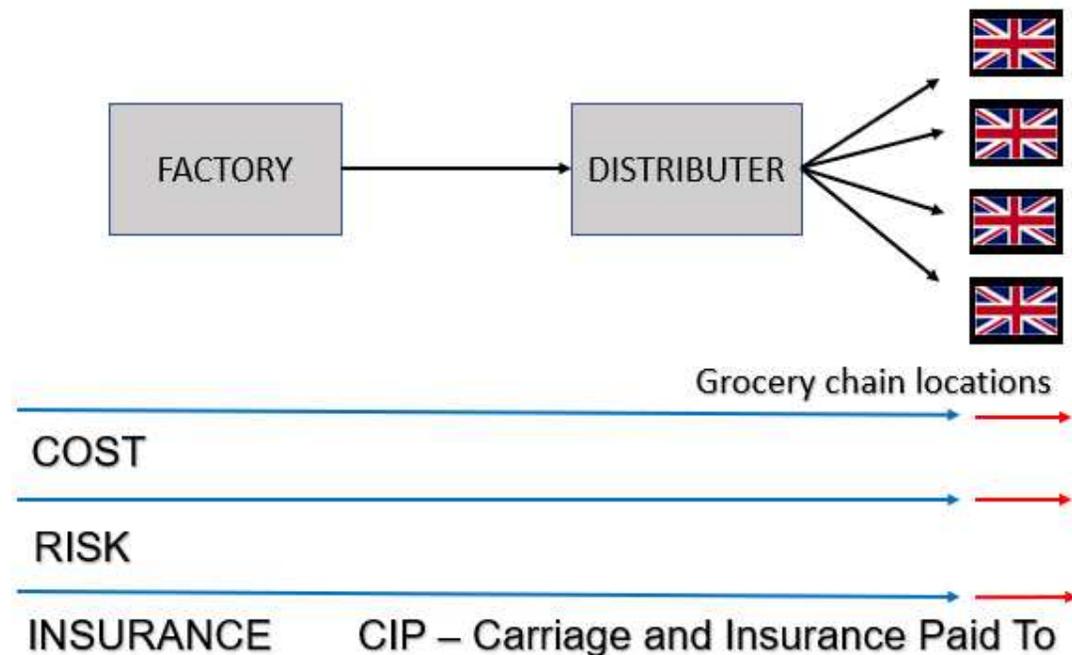


Figure 9: Export supply chain to the United Kingdom

The risks identified in this export supply chain were related to the capabilities of the distributor. The interviews revealed that due to issues with the distributors ability to handle short shelf-life and temperature sensitive products. Waste levels were initially projected at being three percent. However, the waste realised was in the 30 percent range which was perceived as not being sustainable in the long term. In addition, there were disagreements on who should be responsible for the costs of

the waste. This was due to blurred lines in the transfer of ownership. Figure 9 visualises cost, risk and insurance responsibilities in the export supply chain. The figure demonstrates that in this case the responsibility lay on the seller all the way to the final location and this demonstrated why the CIP incoterm was problematic.

The CIP incoterm used in the export supply chain caused complications because it was not clear where the transfer of ownership occurred. In the CIP incoterm ownership is transferred to the buyer when the seller delivers the goods to the transportation company of their choice. However, in this case there was a misunderstanding between the parties where the true point of transfer of ownership took place. The insurance policy also differed from the CIP incoterm. The seller handles insurance claims due to customer service reasons even though due to the CIP incoterm this role should be with the buyer.

Figure 9 shows how the costs, risks and insurance differed from the typical CIP incoterm and the company was responsible of cost, risks and insurance all the way from the factory to the store locations. It is important to add that during the interviews it was stated that a food industry company is always partly liable for the product though out the supply chain. This meant that a consumer that buys the product in the grocery store has the right to claim compensation directly from the manufacturer or brand owner even though the products are sold through another company.

During the interviews it became apparent that the incoterm selection did not reflect the reality in which the export supply chain operated in and all parties involved were not clear on the point of transfer of ownership. The company could benefit by using incoterms that are more in line with their export operations. There has been discussion at the company to switch over to D-class incoterms that would reflect their current responsibilities with risks, insurance and costs. The findings of this thesis support this decision.

A consensus opinion among the interviewees was that arrangements where a distributor handles the company's products without owning them or being responsible for the products should be avoided. Other mitigation methods included

constant learning and deepening the relationship with the distributor. The company eventually faced uncertainty in the export supply chain because of environmental risks such as Brexit that contributed to the company's divestment from the market.

4.11.2 Spain – Competitive environment demands flexibility

This chapter discusses the export supply chain to Spain. The export supply chain begins from three different factories that manufacture products according to customer orders. The products are shipped to an export terminal where pallets from different factories are combined and shipped onwards to the distributor in Spain. The transfer of ownership occurs when the products are unloaded to the distributor's warehouse. The distributor then fulfils orders from multiple grocery chain locations and additionally handles promotion of the products in the country. The incoterm used in this chain is CIP to the distributor. It is important to state the difference between this supply chain to the one mentioned previously to the United Kingdom. In the Spanish supply chain the ownership of the goods transferred to the distributor once the products were received at the distributor's terminal. This meant that risks involved with logistics and other handling was carried by the seller. This demonstrates the high risk involved with blurred lines of ownership.

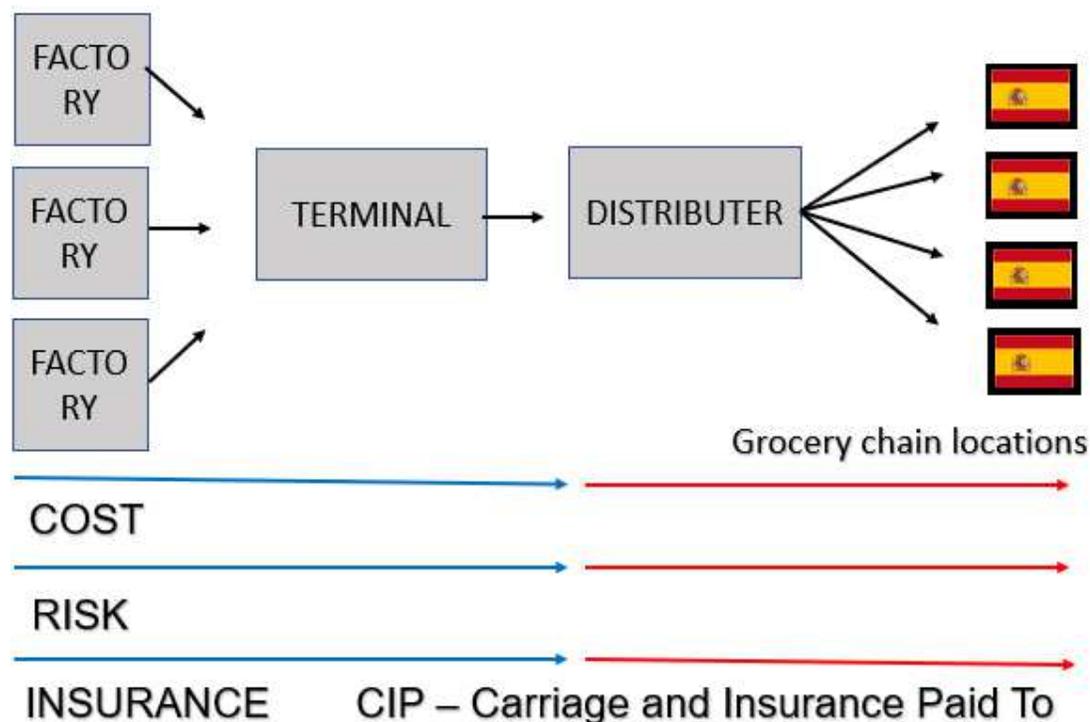


Figure 10: Export supply chain to Spain.

The first risks that were identified were risks related to the initial stages of market entry. Experiences from the interviews revealed that to succeed in this highly competitive market the company must have the capability to produce small batches of products with short lead times. This proved difficult for a company that's manufacturing is catered to large quantities and orders were significantly smaller than the minimum produced batches. In addition, market specific products that were only sold to the Spanish market made manufacturing more inflexible because the production could not be combined with products to other destinations and materials for those products had to be sourced separately. These issues were thought to diminish once sales volumes grew because then manufactured batches and procured materials could be used more efficiently.

Another characteristic that exposed the company to risks was the competitive environment of the Spanish grocery chains. According to the findings from the interviews there were certain steps that a company had to go through to convince the grocery chain that the company has competitive products and the capability to

supply products to supply demand. Flexibility was key to fulfilling the requirements to get the company's products on the grocery chain shelves. According to the findings from the interviews, for long term success the company should have enough resources budgeted to have new products in the pipeline to be introduced to stores. These products aim to either replace non-competitive products or introduce completely new products.

Mitigation methods for these identified risk sources consisted of growing the volume of the business for the manufacturing and procurement to work at full capacity. In addition, the distributor relationship can be characterised to have elements of collaboration or co-operation that according to the interviews were more effective than contracts.

4.11.3 Poland – Disrupted distributor information flows

This chapter summarises the export supply chain to Poland. The export supply chain begins from the two factories where products are produced and sent to a logistics terminal where the pallets are combined for shipment. Once the products are ready, the distributor arranges transportation from the terminal and ownership of the products is transferred once the products are loaded on to the trucks. The distributor then transports the products to Poland where they are sent to different store locations. The incoterm in this supply chain is FCA- Free carrier where the distributor takes most of the responsibility for transportation.

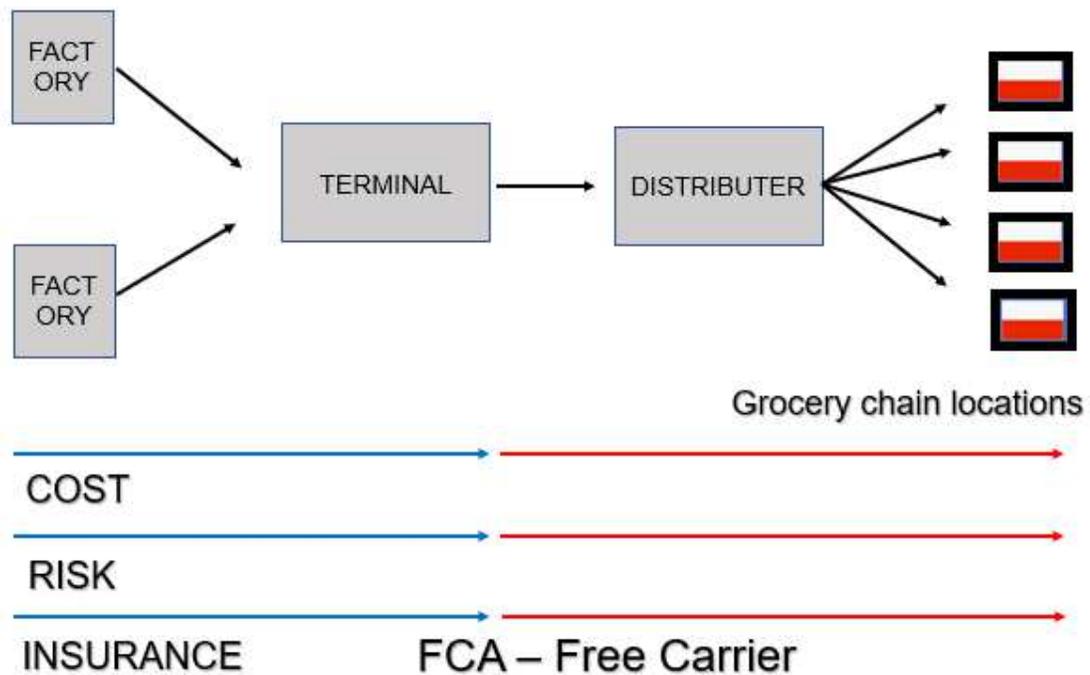


Figure 11 : Export supply chain to Poland

The FCA incoterm has its benefits and risks. The buyer arranges transportation from the case company's terminal and manages most of the risks involved. In addition, arranging transportation can take a significant amount of a manager's time and with the FCA incoterm these duties are performed by the seller. However, the interviews discovered that in the food industry the manufacturer is responsible for the quality of the products all the way to the customer. This means that the case company loses most of the ability to control the quality during transportation and must trust the buyer. The interviews discovered that there had been instances where products were found to be defective and it was hard to locate at what point of the supply chain the deflection had occurred. This was due to the lack of control of transportation.

The interviews revealed that the most prevalent risks in the Polish export supply chain were closely related to lack of information flows from the distributor. These information flows were demand reports, sales information and stock statuses. These issues were mitigated contractually by making new distributor agreements which imposed penalties for not delivering reports on time. There were some issues with

not picking up products on time and the distributor agreement mitigated this issue also by imposing penalties if the products were not picked up after an agreed time. In addition, there was overall concern about not having control over pricing, marketing and sales. These kinds of issues could be mitigated by closer collaboration between the two companies.

5 DISCUSSION

This chapter discusses the results from the empirical research conducted in this thesis and will answer the research questions. In addition, managerial implications, limitations, future research and conclusions are included in the content of this chapter.

The aim of this thesis was to study how the risks of international business affect may affect export supply chains. The theoretical began by a review of risk management, supply chain management and supply chain risk management. After this the theory section reviewed different categorisations of supply chain risks in the supply chain management literature. These risks worked as the basis of the interview structure that was used to structure interviews conducted at the case company. In addition, the theory section discussed measures that have been used to mitigate supply chain risks.

The single case study was conducted at a Finnish dairy company and studied export supply chains for consumer products to three export markets: The United Kingdom, Spain and Poland. An interview structure that was based on the supply chain risks that were identified from the literature in the theory section of this thesis and interviewees were asked of mitigation measures to risks that were discussed. In addition to the mitigation methods for each of the supply chain risk categories, this thesis reviewed insurance use and incoterm selection as a way of mitigating risks in the export supply chain.

5.1 Summary of results

This chapter will provide a summary of the results of this thesis. The main research question of this thesis was: *How the risks of international business may affect export supply chains?* This question will be answered at the end of this chapter after by first answering the sub research questions that will help describe the affect of risks in international business that may affect export supply chains. The sub research questions of the research were: *What are the supply chain risks for dairy industry exports?* and *How can companies mitigate these risks?*

A modified categorisation of risks was formed based on the many categorisations reviewed in the theory part. The modified categorisation included the following risks:

- Supply risks
- Operational and Organisational risks
- Environmental risks
- Transport risks
- Demand risks
- Security risks
- Financial risks

In the supply risks category long lead times in product packaging procurement were identified as risk sources. These are risk sources for supply risks that are consistent with the research by Manuj & Mentzer (2008). Long lead times contributed to lack of flexibility when launching new products into markets. In addition, markets had market specific packaging requirements that meant the company had to make different packages for each market. According to the research by Tang & Tomlin (2018) this kind of supply risk sources can be mitigated by dual sourcing or multiple sourcing that could potentially reduce lead times which would bring flexibility to the sourcing of packaging materials. Other supply risk sources included market specific

product ingredients. A product was identified in the research which was only sold to one market which meant that ingredients could be combined with other products and had to be procured only for this product range. These risks were mitigated by careful forecasting of demand to forecast the number of packages required and designing packages that could be sold to multiple markets. Designing packages that could be sold to multiple markets can be seen as mitigation methods similar to Lee's (2004) research in flexible product designs.

Several sources of operational and organisational risk could be identified. Profitability in the early stages of market entry, high domestic costs, competitiveness of the grocery chain retail market and distributor capability were among the risk sources identified. Mitigation measures for these risk sources were based on operational or organisational capability. Careful planning, risk assessment of distributors and flexibility of decision making, and production were methods that could be identified from the data.

Environmental risks were not originally part of the interview structure. However, four risk sources that were a product of the supply chain environment could be identified. These risk sources were: the refugee crisis, Brexit, the competitive environment and labour disputes or strikes. The refugee crisis contributed to stowaways in shipments and these risk sources are hard to predict and are mainly mitigated by cargo insurance. Brexit is a form of political risk that contributed to an exit from the United Kingdom market. The competitive environment was found to be mostly mitigated by operational or organisational capability. Labour strikes were found difficult to mitigate due to their unexpectedness. However, insurance was found to be a good mitigation method to recover losses of such events.

Stowaways in shipments and equipment malfunctions were the major transport risks that were identified from the interviews. Mitigation methods for stowaways were insurance and, corrective actions by customs and transportation companies. Equipment malfunctions were mitigated by regular checks on the cargo holds of vehicles. However, most of this mitigation was the responsibility of the transportation companies.

Demand risks could be identified from the research. Forecasting, budgeting for demand and the fluctuation of demand were among the risk sources identified. The main demand related mitigation method that could be identified was initiating production only after orders were finalised. This ensured that there was no excess inventory that could result in waste and costs. The capability to budget for demand was identified as key in the ability to compete in export markets. Other mitigation methods included distributor agreements and imposing penalties for breaching these agreements. These are consistent with control measures researched by Christopher & Lee (2004).

Two kinds of security risks were identified: cargo breaches by stowaways and intellectual property risks. Intellectual property risks were mitigated by contracts and non-disclosure agreements. In addition, the company does not reveal any more information to distributors and customers than necessary to protect its trade secrets.

Two kinds of financial risk were identified from the interviews: unsuccessful export operations and customer credit risk. In international business companies must take risks to succeed at markets and these risks can realise resulting in costs. The only way to mitigate these risks is overall competitiveness of the company. Customer credit risk is another type of risk that can occur in export supply chains. The company has a policy in place to evaluate customers credit ratings and adjust their payment terms according to those evaluations. Contracts were found to be important ways to mitigate these risks because they clarify who is responsible if unsuspected costs occur.

This thesis has identified risks in a dairy company's export supply chain and presents what kinds of mitigation methods are used to avoid and mitigate these risks. Together these actions show how the risks of international business affect export supply chains. In the dairy industry these risks are especially highlighted because of the nature of these products being short life cycle. This fact makes common supply chain risk management methods such as stockpiling difficult because of the perishable quality of the products in question.

This research showed that supply chain risk management consists identifying risks, developing mitigation methods, forming contingency plans and there are not one but many approaches to supply chain risks management. Careful planning, learning from past mistakes and long-term strategy were found to be key ways of mitigating negative effects of the supply chain. In addition, this thesis showed that supply chain risks management is a cross-departmental effort where a company should utilise resources across its organisation in its risk management efforts.

5.2 Managerial Implications and suggestions

Overall, the identified risks and their mitigation methods found in these research work as a guide for companies to manage their exposure to risk. During the research, it was discovered that every export supply chain along with its different partners, distributors and customers are different. Therefore, most companies often must learn from realised risks before they can proactively mitigate them. By using the research results of this thesis managers can hopefully identify and mitigate risks instead of learning these lessons the hard way.

According to the interviews there was concern that different departments did not communicate with each other as much as they could. In this case, it meant export managers and risk managers. While planning cases and keeping the both parties involved in the decision making the company could benefit from a more comprehensive approach to risk identification and mitigation. The sales managers could hear opinions from a different perspective and risk managers would be more knowledgeable of how export processes and sales operate. A process of risk management could be suggested by using the five phases of risk management by Tummala & Schoenherr (2011). Table 6 describes the phases and actions of the risk management process.

Phases of risks management:	Actions:
1. Risk identification	Comprehensive and structured identification of possible risks based on a review of past experiences and possible risks of the export market in focus. Risks could be divided into the categories presented in this thesis to help identification.
2. Risk measurement	Determination of the consequences of identified risks together with the estimation of their magnitude of impact on the supply chain.
3. Risk assessment	In this phase the likelihood of these risks are assessed by preferably objective information. However if objective information is not available subjective information can be used for approximation.
4. Risk evaluation	Risk evaluation determines what degree of effort will be invested into mitigation and which risks are not worth mitigating because of their unlikeliness or minimal impact. This phase also includes the forming of contingency plans.
5. Risk control and monitoring	Examining progress of risk management actions and implementing corrective measures. In addition, providing guidelines for preventive measure should be

Table 6: Risk management process. (Adapted from Tummala & Schoenherr, 2011)

The interviewees stated that the best way of mitigating risks that have been identified in this thesis is careful planning before entering markets together with establishing relationships with distributors. In addition, careful contract negotiations were thought as an important point of risk management. Companies should proactively think of different scenarios of what can go wrong, what should be done and who is responsible for the costs and take these to account when negotiating new contracts.

During the interviews it was discovered that sale managers, export managers and export coordinators have a vast amount of knowledge about their experiences at these export markets and only a fraction of that knowledge is documented. Based on these discoveries this thesis proposes a system where past failures and

successes could be documented for future export operations. The reasoning behind this is that the employees that currently work at the company may one day leave and they will be taking all that experience with them. Worst case scenario would be that new managers would have to repeat the mistakes of their predecessors and a place where this knowledge could be shared and found would ensure that the knowledge stays at the company.

Flexibility of the organisation and production was mentioned as a current weakness to achieve the necessary capability to compete in markets. The reason for the rigidity of the decision making is understandable. The company exports products at a small scale to several markets and if the market appears promising they gradually increase their investment. Big investments in the beginning of market entry would come with great risks. However, it should be stated that without considerable investment and long term planning it will be difficult to compete against major international corporations such as Nestle or Danone. There should be flexibility in budgeting for demand and a realisation that entering a market takes time and effort.

5.3 Limitations

This research has some limitation that are described here. The research conducted in this thesis is based on one company and the method was a qualitative single case study. This means that the result found in this study could vary significantly if the interviews were done at another company. The company in question was large in scale and it is possible that companies of different sizes would have different capabilities of mitigating risk for example. The dairy industry, the industry in which the company operated can show different risks as another industry that perhaps does not have short life cycle products.

Another example of a limitation is the way in which the interviews were conducted. The interview structure was formed based on the theory part of this thesis. Other researches may conduct a different classification of risks which could alter the results significantly.

As to the generalisability of this thesis. This research could be used as an example of what kinds of risks can be identified in export supply chains outside of the industry. A large number of risks that were identified were not dairy industry specific and can be similar than risks in other perishable supply chains.

5.4 Future research

Future research could focus on the insurance dimension of risk mitigation. During the interviews it was realised that the insurance section in this thesis was just scratching the surface and a more thorough cost and benefit analysis could be conducted. More research could be done focusing on distributors in an export supply chain and what kind of key performance indicators could be formed for them to ensure a successful relationship. Other research topics could include: contracts as a means of risk management, mitigation of political risks such as Brexit and focusing on the characteristics of the grocery chain retail markets of one of the countries in this thesis. In addition, the connection between incoterm and insurance selections would make a practical research topic that could benefit the industry.

REFERENCES

Adebanjo, D., 2009, Understanding demand management challenges in intermediary food trading: a case study, *Supply chain management: An international journal*, 14, 3, pp. 224- 233.

Ashkenas, R., 2015, There's a difference between cooperation and collaboration, *Harvard Business Review*, 20,

Barrat, M., & Oke, A., 2007, Antecedents of supply chain visibility in retail supply chains: A resource-based theory perspective, *Journal of Operations Management*, 25, pp. 1217-1233.

Bechtel, C., & Jayaram, J., 1997, Supply Chain Management: A Strategic Perspective, *The International Journal of Logistics Management*, 8, 1, pp.15-34

Blos, M., Quaddus, M., Wee, H.M. & Watanabe, K. 2009, Supply chain risk management (SCRM): a case study on the automotive and electronic industries in Brazil, *Supply Chain Management: An International Journal*, 14, 4, pp.247-252.

Chopra, S. & Sodhi, M.S. 2004, Managing risk to avoid supply-chain breakdown, *Sloan Management Review*, 46, 1, pp. 53-61.

Christopher, M. & Holweg, M., 2011, "Supply Chain 2.0": managing supply chains in the era of turbulence, *International Journal of Physical Distribution & Logistics Management*, 41, 1, 63-82.

Christopher, M. & Lee, H., 2004, Mitigating supply chain risk through improved confidence, *Physical Distribution & Logistics Management*, 32, 5, pp. 388-396.

Dong, T. & Tomlin, B, 2012, Managing disruption risk: the interplay between operations and insurance, *Management Science*, 58, 10, pp. 1896.

Food From Finland, 2019, Finnish food hits the mark. [www-document]. [Referenced 29.01.2019]. Available: <https://www.businessfinland.fi/en/for-finnish-customers/services/build-your-network/bioeconomy-and-cleantech/food-from-finland/>

Giles, J., 2015, Change in the EU dairy sector post quota: More milk, more exports and a changing farmer profile, Euro Choices, 14, 3, pp. 20-25

Gooley, T., 2000, Incoterms 2000: What the Changes Mean to You. Logistics Management and Distribution Report, 39, pp. 49.

Hendricks, K., B. & Singhal, V., R., 2001, Firm characteristics, total quality management and financial performance, Journal of Operations Management, 19, pp. 269-285.

Hien, N., Laporte, G. & Roy, J. 2009, Business environment factors, incoterms selection and export performance, Operations and supply chain management, 2, 2, pp. 63-78.

Ho, W., Zheng, T., Yildiz, H. & Talluri, S., 2015, Supply chain risk management: a literature review, International Journal of Production Research, 53, 16, pp. 5031-5069.

Hodge, N. 2017, Preparing for Brexit, Risk Management, 64, 6, pp. 18-25.

Holweg, M., Disney, S., Holmström, J. & Småros, J., 2005, Supply Chain Collaboration: Making Sense of the Strategy Continuum, 23, 2, pp. 170-181.

Hormozi, A., 2001, Agile manufacturing: the next logical step, Benchmarking: An International Journal, 8, 2, pp. 132-143.

Hübner, A., H., Kuhn, H. & Sternbeck, G., M., 2013 "Demand and supply chain planning in grocery retail: an operations planning framework", *International Journal of Retail & Distribution Management*, 41, 7, pp. 512-530,

Jimenez, G. 1998, *Incoterms Questions and Answers*. ICC Publishing. 166 pages. Paris.

Juttner, U., Peck, H. & Christopher, M. 2003, *Supply Chain Risk Management: outlining an agenda for future research*, *International Journal of Logistics: Research and Applications*, 6, 4, pp. 197-210.

Khojasteh, Y. 2018, *Supply chain risk management: Advanced tools, models and developments*, Singapore: Springer.

Kleindorfer, P. & Saad, G. 2005, *Managing Disruption Risks in Supply Chains*, *Production and operations Management*, 14, 1, pp. 53-68.

Leat, P. & Revoredo-Giha, C., 2013, *Risk and resilience in agri-food supply chains: the case of the ASDA PorkLink supply chain in Scotland*, *Supply Chain Management: An International Journal*, 18, 2, pp. 219-231.

Lee, H., 2004, *The Triple-A Supply Chain*, *Harvard Business Review*, 82, 10, pp. 102-112.

Lee, H. & Wolfe, M., 2003, *Supply chain security without tears*, *Supply Chain Management Review*, 7, 3, pp. 12-20.

Lee, H., Padmanabhan, V., & Whang, S., 1997, *The Bullwhip Effect in Supply Chains*, *Sloan Management Review*, 38, 3, pp. 93-102.

Lintukangas, K., Hallikas, J., Kähkönen, A-K., Bolander, I. & Multaharju, S., 2014, *Supply networks risks and costs in Finnish project business*. *Technology Business Research Center*, 9, 32, pp. 46.

Lintukangas, K., Kähkönen, A-K., & Ritala P., 2015, Supply risks as drivers of green supply management adoption, *Journal of Cleaner Production*, 112, pp. 1901-1909.

Manuj, I. & Mentzer, J., T., 2008, Global Supply Chain Risk Management, *Journal of Business Logistics*, 29, 1, pp. 122-156.

Mason-Jones, R., & Towill, D., R., 1997, Information enrichment: Designing the supply chain for competitive advantage, 2, 4, pp. 137.

Miller, K., 1992, A framework for integrated risk management in international business, *Journal of International Business Studies*, Second Quarter, pp. 311–331

Min, S., Roath, A., S., Daugherty, P., J., Genchev, S., E., Chen, H., Arndt, A., D. & Richie, R., G., 2005, Supply chain collaboration: what's happening? *International Journal of Logistics Management*, 16, 2, pp. 237-256.

Ritchie B., & Brindley C. 2007, Supply chain risk management and performance: A guiding framework for future development, *International Journal of Operations & Production Management*, 27, 3, pp. 303-322.

Rowe, W., D., 1980, Risk assessments and methods, Conrad J.(Ed), *Society, Technology and Risk Assessment*, Academic Press, London, 209.

Singh, P., J. & Power, D., 2009, The nature and effectiveness of collaboration between IRMS, their customers and suppliers: a supply chain perspective, *Supply Chain Management: An International Journal*, 14, 3, pp. 189-200.

Snyder, L., Atan, Z., Peng, P., Rong, Y., Schmitt, A. & Sinoysal, B. 2016, OR/MS models for supply chain disruptions: a review, *IIE Transactions*, 48, 2, pp. 89.109,

Soosay, C., A. & Hyland, P., 2015, A decade of supply chain collaboration and directions for future research, *Supply Chain Management: An International Journal*, 20, 6, pp. 316-630.

Sreedevi, R. & Saranga, H., 2017, Uncertainty and supply chain risk: The moderating role of supply chain flexibility in risk mitigation, *International Journal of Production Economics*, 193, pp. 332-342.

Swaminathan, J., M. & Tayur, S., R., 2003, Models for supply chains in e-business, *Management Science*, 49, 10, pp. 1387-1406.

Taylor, D., H & Fearne, A., 2009, "Demand management in fresh food value chains: a framework for analysis and improvement", *Supply Chain Management: An International Journal*, 14, 5, pp. 379-392.

Tang, C. & Tomlin, B., 2018, The power of flexibility for mitigating supply chain risks, *International Journal of Production Economics*, 116, 12-27.

Tummala, R. & Schoenherr, T., 2011, Assessing and managing risks using the Supply Chain Risk Management Process (SCRMP), *Supply Chain Management: An International Journal*, 16, 6, pp. 474-483.

Van der Vorst, J. & Beulens, A., 2002, Identifying sources of uncertainty to generate supply chain strategies, *International Journal of Physical Distribution & Logistics Management*, 32, 6, pp. 409-430.

Voss, C., Tsikriktsis, N. & Frohlich, M., 2002, Case research in operations management, *International Journal of Operations & Production Management*; 22, 2, pp. 195-219.

Wiengarten, F., Humphreys, P., Gimenez, C., & McIvor R., 2016, Risk , risk management practices, and the success of supply chain integration., *International Journal of Production Economics*, 171, pp. 361-370.

Zhen, X., Li, Y., Cai, G. & Shi, D. 2016, Transportation disruption risk management: interruption insurance and backup transportation, Transportation Research. Part E. Logistics & Transportation Review, 90, 2016.

Zsidisin, G., 2003a, A grounded definition of supply risk, Journal of Purchasing & Supply Management, 9, pp. 217-224.

INTERVIEW FORM

Interview Semi- Structure for Master's in Supply Management Thesis:
**Identification and mitigation of risks in an Export supply chain:
Case of Finnish Dairy Company Exports**

Interviewee:

Job Title:

Experience in industry:

Background of Exports:

Export Supply Chain Mapping:

Section 1: Supply related risks / Mitigation strategies

Section 2: Operational/Organisational risks/ Mitigation strategies

Section 3: Transport related risks / Mitigation

Section 4: Demand related risks / Mitigation strategies

Section 5: Security risks/ Mitigation strategies

Section 6: Financial risk / Mitigation strategies

Section 7: Contracts as Means of risk management

-Incoterms

-Insurance

Section 8: Other issues in export supply chain?