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MANAGING RISKS IN SUSTAINABLE SUPPLY CHAINS

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ABSTRACT

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The aim of the study is to find out what sustainability-related risks exist in supply chains and how companies manage these risks. The study also aims to find out which factors hinder sustainability-related risk management. Stakeholders' growing interest in sustainable business practices has increased the importance of sustainability-related risk management. Companies are expected to act responsibly and to ensure the sustainability of their suppliers in the supply chain. The framework of the thesis explains sustainable supply chain management from a risk management perspective. The empirical part of the thesis was implemented as a qualitative Case study, for which eight Finnish companies were interviewed. The interviewees represent experts in purchasing, supply management and sustainability. The research results show similarities with the theoretical part. By managing sustainability-related risks, Case companies simultaneously manage their reputation and enhance their sustainability performance throughout the chain. Albeit, companies operate in different industries, they face similar sustainability-related risks. In addition, companies face similar challenges in implementing risk management. More research is needed to measure the financial impact of sustainability-related risk and more extensive Case study on the subject.

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Pro gradun tarkoituksena on selvittää mitä vastuullisuusriskejä esiintyy yritysten toimitusketjuissa ja millä tavoin yritykset hallitsevat riskejä. Tutkielmassa pyritään myös selvittämään, mitkä tekijät hankaloittavat vastuullisuusriskien hallitsemista. Sidosryhmien kasvava kiinnostus vastuullista liiketoimintaa kohtaan on lisännyt vastuullisuusriskien merkitystä yritysten riskienhallinnassa. Yritysten odotetaan toimivan vastuullisesti ja pystyvän varmistamaan toimitusketjujen muiden osapuolten vastuullisuus. Tutkielman viitekehys käsittelee vastuullista toimitusketjunhallintaa riskienhallintänäkökulmasta. Tutkielman empiria toteutettiin laadullisena Case-tutkimuksena, jota varten haastateltiin kahdeksaa suomalaista yritystä eri toimialalta. Haastateltavat edustavat hankintatoimen ja vastuullisuuden ammattilaisia. Tutkimustulokset osoittavat yhtäläisyyksiä teoriaosuuteen. Case-yrityksille vastuullisuusriskien hallitseminen on osa maineriskin hallintaa, mutta myös tärkeä osa vastuullista liiketoimintaa, jolla pyritään lisäämään liiketoiminnan kokonaisvastuullisuutta. Yritysten kokemat vastuullisuusriskit ovat myös samankaltaisia. Lisäksi yritykset kohtaavat samanlaisia haasteita riskienhallitsemisen toteuttamisessa. Lisää tutkimusta tarvitaan vastuullisuusriskien taloudellisten vaikutusten mittaamisesta sekä laajempaa Case-tutkimusta aiheesta.

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” First, think. Second, dream. Third, believe. And finally, dare.”

- Walt Disney

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1 INTRODUCTION

Sustainability is one of the most discussed topics among companies and scientific community in today's world and its importance has grown significantly over the last decade. Companies are demanded by their stakeholders to bear responsibility for the environmental and social impact of their operations. With the sustainability trend and pressure from stakeholders, companies have adopted different practices to reduce their carbon footprint and to improve their social image (Gouda & Saranga 2018, 5820). The impacts of businesses are not only limited to their immediate operating environment, but today most companies operate in a globally competitive market where supply chains extend from one side of the globe to the other. Global supply chains allow companies to reach raw materials and goods they would never otherwise be able to offer their customers. However, long supply chains come at a price and expose companies to high risk level (Giannakis & Papadopoulos 2016, 455). Suppliers are often located far away from the focal company and often in countries which are characterized by relatively poor sustainability-related condition (Busse, Schleper, Niu and Wagner 2016, 442). The greater the number of actors in the chain, the more challenging it is to ensure supply chain sustainability and manage risks. In some cases, it is impossible for the focal company to know all the parties in its supply chain and thus it is difficult to know under what conditions the products and raw materials are produced. Unless risks are identified, they are difficult to manage. For this reason, risk management is the cornerstone of the operation of every organization and an important issue for supply chain managers (Hofmann, Busse, Bode & Henke 2013, 160). Moreover, even the best organisations with a fully-fledged system are not entirely immune against unfavourable events.

As the sustainability-related aspects play a key role in the company's operations, sustainability risk has become a new focus in a modern risk management. (Anderson & Anderson 2009, 25) Increasing global supply chains possess a challenge as companies should be able to monitor and manage their operations throughout their chain to ensure sustainability. As supply chains become increasingly global, sustainability and vulnerability simultaneously become more important. (Christopher and Gaudenzi 2015, 64) Social, ecological or ethical

problems that exist in the supply chains can cause significant harm to businesses if not handled properly and the results may be a loss of reputation among stakeholders. Although the risks are known, it is argued that supply chain risk management still neglect these sustainability issues. Moreover, even though companies are increasingly embracing sustainability in their strategy, little is known how sustainability issues turn into risks (Hofmann et al. 2013, 160) or how companies manage their lower-tier suppliers and how risky these suppliers actually are (Villena & Gioia 2018, 1). It goes without saying that responsibility plays a significant role in the business operations and its consideration is a necessity if the company wants to be competitive in the future. Therefore, in-depth understanding of the sustainability risks is needed to develop an effective risk management framework. Without a clear understanding of sustainability-related risks, it is difficult to suggest remedies. (Hofman et al. 2013, 161) In order to call the supply chain sustainable, each member of the chain must be truly sustainable (Ha-Brookshire 2017, 227).

1.1 Research objectives, questions, and limitations

Supply chain risk management has been extensively discussed and studies have focused mainly on upstream supply chain, for example, quality problems and risk of default and bankruptcy of supplier (Manuj and Mentzer 2008; Hofman et al. 2013, 160). Although research findings show that companies may experience losses of ignoring environmental and social factors in the supply chain, sustainability-related issues are often ignored in supply chain risk management discussions (Hofman et al. 2013, 161). Without a broad understanding of how sustainability-related risks emerge, it is difficult for a focal company to implement successful and effective risk management in its operations. In fact, current frameworks of supply chain risk management (SCRM) do not provide any means of how sustainability issues materialize as risks (Hofmann et al., 2014; Rostamzadeh et al. 2018, 652). Thus, the aim of the study is to generate insights sustainability-related risk management. A concrete objective for the study is to find out how companies are implementing risk management to ensure the sustainability of the entire supply chain. To gain better insights, 8 Case companies are interviewed for the research to better understand the issue.

The main research question and supporting sub-questions will be as follow:

Table 1. Research questions

Main research question
1. How do companies manage sustainability-related risks in supply chains?
Sub-questions
1.1 What sustainability-related risks exist in supply chains?
1.2 What challenges are associated with sustainability-related risk management?
1.3 What is the role of supplier cooperation in risk management?

There are certain limitations that will be made for the study. To better manage the topic, the financial cost of managing sustainability-related risks will not be addressed and thus will be excluded from the scope of the study. Similarly, only Finnish companies were selected for the study. It is worth to mention, however, that since all the companies chosen for the research operate globally, the country of origin of the company is irrelevant to the results of the study.

1.2 Theoretical framework

The theoretical framework presents concepts that are relevant to the research. The framework below (Figure 1) illustrate which issues affect to supply chain risk management, which in turn enable implementation of sustainable supply chain management.

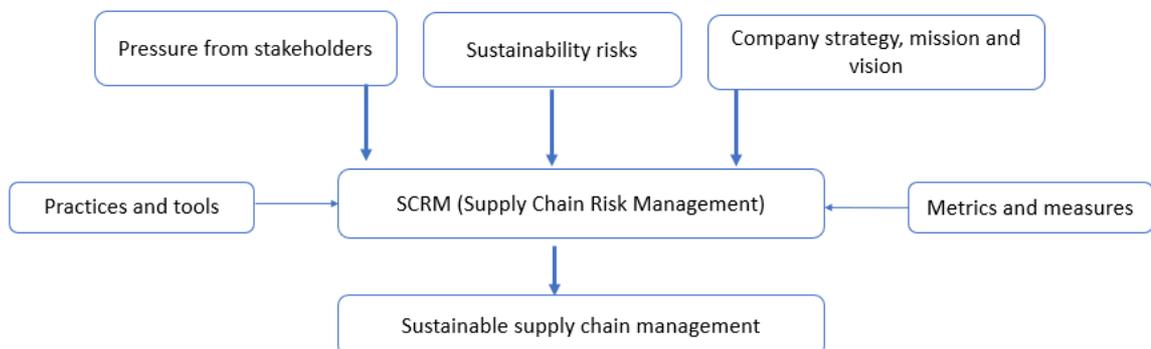


Figure 1. Theoretical framework of the study

The upper part of the figure illustrates what is affecting the implementation of risk management. Companies are demanded by their stakeholders to implement sustainability in their operations. The stakeholders include customers, government agencies, and non-governmental organizations to name a few. These groups impose the corporate sustainability requirements on which the companies must operate. Similarly, companies also have their own will to act sustainably and make their chain more sustainable. Sustainability can thus also be part of a company's strategy, mission and vision, in other words, the core business values. Sustainability risks which exist in the supply chains are the third factor affecting the implementation of risk management. Successful risk management is implemented using a variety of assessment tools and practices. These include, but are not limited to, risk and supplier evaluation.

1.3 Key concept definitions

The following section focuses on defining the necessary concepts of the study. The following concepts are discussed more thoroughly in the theoretical part of the study.

Sustainability

"Development that meets the needs of the present without compromising the ability of future generations to meet their needs" (World Commission on Environment and Development 1987, 8). In business context, sustainability considers three components: natural environment, society and economic performance (Carter and Rogers 2008, 364).

Sustainable supply chain

"Entire supply chain is working together to achieve sustainability goals while meeting business objectives" (Ha-Brookshire 2017, 233).

Sustainable supply chain management (SSCM)

"Strategic integration and achievement of an organization's social, environmental and economic goals in the systemic coordination of key internal business processes

for improving the long-term performance of the individual firm and its supply chains” (Carter and Rogers 2008).

Supply chain risk management (SCRM)

“The ability of a firm to understand and manage its economic, environmental, and social risks in the supply chain” (Carter and Rogers 2008, 366).

Sustainability-related risk in supply chain

A risk within a focal company’s supply base that “may provoke harmful stakeholder reactions” (Hofman et al. 2013, 168) if the focal company is considered responsible for the issue. Risks sources include “social issues (related to working conditions and compensation) ecological issues (input-related aspects, such as energy consumption, or resource utilization, as well as production output-related aspects, such as emissions and recycling) ethical business conduct issues (corruption and business connections to dubious individuals or firms). (Barnett, 2012; Hoffmann et al. 2014, 166)

1.4 Thesis outline

The thesis will be structured in the following way as illustrated in the Figure 2 below.

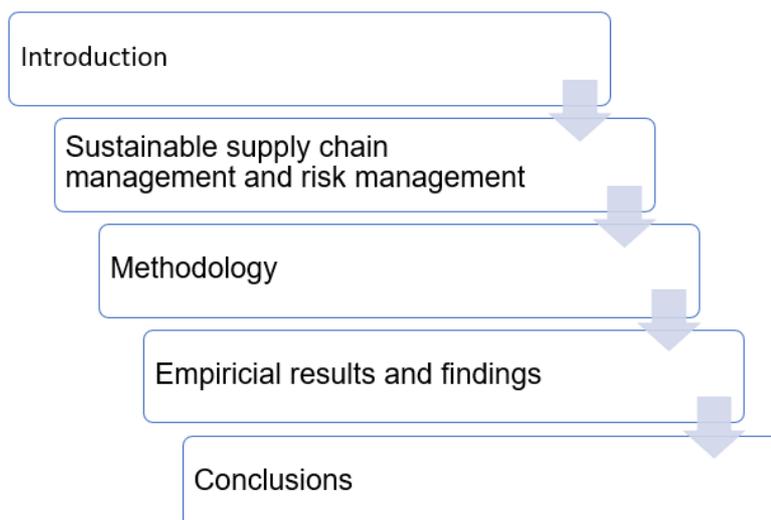


Figure 2. Structure of the thesis

First, introduction presents the subject to the reader after which the research questions and theoretical framework of the study is presented with the key definitions. The theoretical part of the study will be presented in chapter two and three. Literature review focuses on studies that are relevant to the thesis topic and objectives of the research, in other words, studies related to sustainability and supply chain risk management. Fourth chapter of the study presents research methodology in detail to break down, among other things, the data gathering process. Last part of the study focuses on making relevant conclusions and discussing the findings of the study. Limitations of the study and suggestions for further research will be also presented.

2 SUSTAINABLE SUPPLY CHAIN MANAGEMENT AND RISK MANAGEMENT

Sustainability has raised its head over the last decade due to growing awareness of the public. Increasingly people are concerned about the impact of businesses on nature and the surrounding communities. The sustainable development term has established itself over the years, but historically, the topic is relatively new, receiving wider publicity in the 90's. The idea was brought into broader discourse by World Commission on Environment. There are number of definitions on the subject, but one of the most accepted is "meeting the needs of the present without compromising the ability of future generations to develop" (World Commission on Environment and Development 1987, 8) Alongside the sustainability has come a similar concept called corporate sustainability, which means "meeting the needs of a firm's direct and indirect stakeholders (such as shareholders, employees, clients, pressure groups, communities, etc.), without compromising its ability to meet the needs of future stakeholders as well" (Dyllick and Hockerts 2002, 131). Through the opportunities brought by the global market economy, companies operate in a world where their sphere of influence extends beyond their geographical location. Similarly, stakeholders are not just employees of the company and groups in the immediate vicinity, but as the supply chains extend further, the impact groups are even further away. Companies are increasingly aware of their responsibility to address sustainability in their operations, as stakeholders demand sustainability from them, both in their operations and in the final product. Above all, businesses have the responsibility because they can influence the social and environmental conditions, either through action or inaction. (Klassen & Vereecke 2012, 104) Companies must actively work for a long-term success and thus meet the needs of both present and future stakeholders.

Increased public debate and concern about the state of the environment among stakeholders has led companies to introduce and develop a number of environmental systems, with the aim to positively enhance environmental performance (Handfield et al. 1997; Melnyk et al. 2003; Zhu and Sarkis 2004; Michelsen et al. 2006; Darnall et al. 2008; Morali & Searcy 2012, 636). Companies can influence how resources are used and how much waste is released from

production or product into the environment. Thus, companies are the key to solving today's problems, including, global warming. (Dyllick and Hockerts, 2002; Beske, Koplin, Seuring 2008, 65). However, company activities are more than environmental impacts. Increasingly, growing number of products are manufactured in emerging and developing countries, where most of the companies spend volumes are also directed. (Reuter, Foerstl, Hartman, Blome 2010, 45) Tempted by the lower production costs, companies expose themselves for fragile and complex supply chains which are often difficult to monitor, for example, for social sustainability which occur in developing countries. By solely adopting various environmental systems, companies do not comprehensively improve other areas of sustainability.

Nowadays, it is understood that sustainability is a broader concept and sustainable supply chain management (SSCM) aim to incorporate all three dimensions of sustainability: the environment, economic and social sustainability, collectively called the three pillars of sustainability (Morali & Searcy 2012, 636) or triple bottom line (Grant, Trautrim & Wong 2015, 207). In order for future generations to have the same conditions to meet their own needs, sustainability must maintain and balance all three areas of sustainability (Caniëls, Gehrsitz, Semeijn 2013, 135) Sustainable supply chain management is based on all three pillars of sustainability and acts as a response to ordinary supply chain management, which typically focuses on economic and financial business performance (Brandenburg, Govindan, Sarkis, Seuring 2014, 299). Carter and Rogers (2008, 368) define SSCM as a "strategic integration and achievement of an organization's social, environmental and economic goals in the systemic coordination of key internal business processes for improving the long-term performance of the individual firm and its supply chains."

Management process like sustainable supply chain management plays a significant role in achieving social, environmental, and economic performance and thus the company is able to guarantee that the product or service is produced in a sustainable manner with a better resource utilization. (Tseng, Lim, Wong 2015,438) The provision of sustainable products requires collaborative relationship of core business practices including logistics, procurement, knowledge management,

marketing, and operations and the integration of all three sustainability pillars. SSCM is a more holistic approach to traditional supply chain management and it allows an organization to achieve long-term economic viability (Tseng et al., 2008; Kuo et al., 2001; Tseng and Chiu, 2013; Tseng et al. 2015, 437). Respectively, SSCM can reinforce reputation and improve brand image among stakeholders (Maigman and Ferrell 2004; Paulraj, Chen, Blome 2017, 241). SSCM may also boost investors' willingness to invest in business operations (McGuire et al. 1988; Arya and Zhang 2009; Sarkis et al. 2011; Chen, Blome 2017, 241). Investors believe sustainable companies are less risky objects for investments than unsustainable companies as they are less likely to cause environmental mishaps which reduce regulatory cost risks. (Feldman and Soyka, 1997; Caniëls et al. 2013, 135) In this respect, SSCM acts as a strategic tool to increase efficiency and competitiveness and thereby increase profitability (Tseng, Lim, Wong 2015,437).

2.1 Implementation of SSCM

From the traditional business perspective, firms are obliged to meet the needs of their shareholders and stakeholders and bring value to their supply chains. Responding to the external pressure of shareholders and stakeholders is one of the most important motivators in the implementation of sustainable supply chain management. Argued by Wolf (2014, 318), SSCM plays a key role in the activities of companies that are subject to pressure from stakeholders. When looking at the entire supply chain of a product, the focal company consider a longer part of the supply chain, not only for financial reasons, but because it can better ensure product sustainability to its stakeholders. Moreover, companies do not take control of the supply chain from their own desire but also because they are expected to do so. In the context of supply chains, companies are required to be accountable for product design, sourcing, production or distribution to stakeholders (Parmigiani, Klassen, Russo 2011, 215).

External drivers for SSCM are groups such as regulators and governments, competitors and non-governmental organizations as well as the general public, including end-customers. In-house drivers for SSCM implementation are top management with specialized support functions, including sustainability and

corporate responsibility department, which translates the pressure of stakeholders into practical actions (Harms, Hansen & Schaltegger 2013, 207) When being pressured, companies usually passes it to their suppliers enhancing sustainability throughout the supply chain (Seuring & Müller 2008, 1703).

Other motivators for the implementation of SSCM are supplier management for risks and performance and the desire to promote environmental and social perspectives. (Sarkis 2001; Roberts 2003; Darnall et al. 2008; Seuring and Muller 2008b; Björklund 2011; Morali & Searcy 2012, 638) Moreover, companies, regardless of industry, understand that to promote sustainability in the supply chain, the development of risk management tools must become a business priority. (Christopher and Gaudenzi 2015, 58) With supply chains extending to the other side of the world and having a more complex structure, different sources of risk may occur in the SSCM (Valinejad & Rahmani 2018, 55) with a far-reaching effect on the performance of SSCM. (Song et al. 2017, 100)

In order to develop and grow their business, companies must develop an efficient and sustainable supply chain that needs to be managed and assessed based on its performance. (Tseng and Geng, 2012; Tseng et al. 2015, 437) A successful implementation of SSCM requires interaction with other organizations in the supply chain, both upstream and downstream parties (Morali & Searcy 2012, 636). Cooperation between supply chain organizations allows the development of risk management measures, as well as the establishment of coherent environmental and social sustainability standards, according to which the various actors in the supply chain are expected to operate. This enables the realization of the main objective of SSCM, which is the mitigation of social and environmental risks across the supply chain in addition to operational and financial risks. (Cousins et al., 2004; Teuscher et al., 2006; Cheung et al., 2009; Harms et al. 2013, 207)

2.2 Supply chain risk

Every company that needs to obtain products and services is prone to a risk, albeit the nature of the risk depends on many factors such as type of industry, number of suppliers, related production schemes, size of the buying company and type of public exposure. As supply chains grow and become complex networks, they increasingly become vulnerable to a variety of uncertainties. (Teuscher et al. 2006, 1) In the past, companies were operating in a more stable business environment, where demand planning and forecasting were more secure. A similar approach does not currently work due to ever-changing commodity prices (e.g. oil and gas) and political instability affecting market prices. Similarly, the changing nature and the depletion of natural resources, such as the lack of fresh water, have an impact on the market prices of agricultural commodities, which, in addition to the political and social problems, are also a managerial challenge for businesses (Christopher and Gaudenzi 2015, 58).

To carry out risk management, companies should understand the nature of the risks associated with their operations. This is also particularly important because companies generally have limited resources to manage risk. (Song et al. 2017, 100) Despite the numerous meanings and definitions, the risk as a concept can generally be understood as a matter that increases uncertainty which decreases the performance. (Hoffmann et al. 2013, 199) Risk may have a number of distinctive features, but argued by Zsidisin (2002; Zsidisin 2003, 14-15), it can be defined as "the potential occurrence of an incident associated with inbound supply from individual supplier failures or the supply market, in which its outcomes result in the inability of the purchasing firm to meet customer demand or cause threats to customer life and safety." Jüttner, Peck and Christopher (2002; Norrman & Jansson 2004, 436) argue that the word "risk" can cause confusion as it is used both in terms of the "sources of risk" and the "consequences of the risk", even though these two contexts should be distinguished from each other.

The risk is generally perceived to be a negative matter, which at worst can paralyze the whole business. However, risks are not always certain, and they rise only with

a certain likelihood or probability, as showed in Figure 3. The likelihood of the risk can be calculated by counting the times the event occurs divided by the total number of equally possible events (Kerlinger 1986; Zsidisin 2003, 15) or probability of the event times impact on business (Norrman & Jansson 2004, 436). The impact of the risk or significance of the loss may also vary greatly, and it is another element of the risk to be taken into consideration. Generally, it is assumed that the more significant of the losses in a potential event, the greater the risk is. The third element of the risk is uncertainty which can be affected, for example, by the decision maker's limited or incomplete understanding of the loss categories that are associated with a specific operation or which losses can occur. (Zsidisin 2003, 219) The procedures of risk management are discussed in more detail later in the chapter.

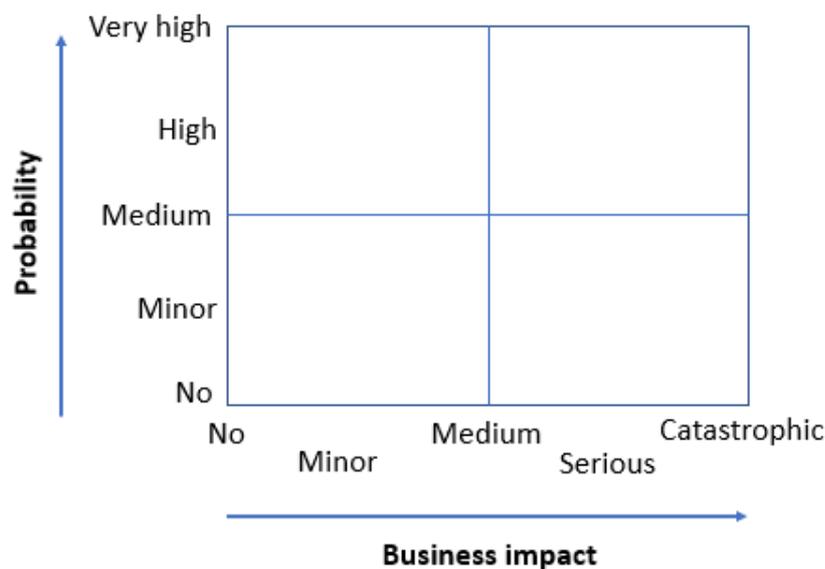


Figure 3. Risk map/matrix (adopted from Norrman & Jansson 2004)

Sources of risk arise either from the environment, from within the company or from the supply chain, which cannot be accurately predicted. Supply chain risks can be divided into two categories, i.e. operational risks and disruption risks (Gouda & Saranga 2018, 5821). Argued by Christopher and Gaudenzi (2015, 64), modern supply chains are more susceptible to disruption than what they used to be. The main source of an operational risk is the failure of the supply chain management process which prevent an organization of meeting the demand of a customer. In turn, disruption risk arises from unexpected event including weather conditions and natural disasters that may be surprising and hard to predict. (Kouvelis et al. 2006;

Kern, Moser, Hartman & Moser 2012, 62). Jüttler, Peck, Christopher (2002; Norrman & Jansson 2004, 436) divide supply risks into three categories; external (e.g. political risks, natural risks, social risks, industry/market risks), internal (e.g. labour strikes, machine failure, IT system uncertainties) and network-related risks (inadequate communication and cooperation between supply chain organizations).

The sources of supply risks can be due to failure of an individual supplier, for example, a delivery problem due to a supplier that prevents the purchasing company from receiving the product it has ordered in the required time. Similarly, prevailing market characteristics determine the number of suppliers available for the purchasing organization which may create a supply risk. The number of available suppliers in the market may be due to oligopoly or monopoly conditions, and as a result the purchasing organization is dependent on a single or sole source supplier. In a worst case scenario, if the purchasing firm does not have a backup supplier it can cause a detrimental effect on profit and cause supply-demand mismatch. In addition to market characteristics, individual supplier characteristics can create a risk of supplies. For example, the inability to “handle demand fluctuations, quality problems or stay in pace with the technological changes” originates from the failure of an individual supplier. (Zsidisin 2003, 220-221)

2.3 Sustainability-related risks in supply chain

Apart from typical supply risk, the sustainability-related risk occurs differently and its impact on the focal company operation differ. It is argued that risk-management often neglect sustainability aspects albeit its impact on corporate performance can be tremendous. The growing awareness of sustainable business practices has increased interest in sustainability-related risks which include environmental, social and economic risks. Typical supply chain risks vary from delivery failures to financial defaults of suppliers, but the sustainability risks differ from these in many ways. They include aspects related to natural ecosystem and environment as well as corporate reputation and compliance with laws. By the definition, sustainability-related risk is a “condition or a potentially occurring event that may provoke harmful stakeholder reactions” which occurs in a focal company’s supply base (Hoffman et al. 2014, 168). The risks are not typical disruptions in the supply chain operations,

but instead they happen in the surrounding environment and communities which are affected by business operations. The common sustainability-related risks for many industries are greenhouse gas emissions, natural disasters, accidents, energy consumption, packaging waste, environmental damages during logistics and transportation. (United Nations Global Compact and BSR 2010; Giannakis & Papadopoulos 2016, 456) However, sustainability-related risks also include violation of workers' rights and unethical practices.

Typical supply chain risks, such as delivery difficulties or production scheduling challenges, pose financial disadvantages for companies as they materialize. The risk is manifested by the availability challenge or delayed delivery when the product is not received at required time. Sustainability-related risk, in turn, arises through stakeholder reaction. Thus, risk is related to the way the company operates to produce the product. However, the consequences of sustainability-related risks can be similar to those of typical supply chain risks, i.e. loss of financial position and decreased sales. Anecdotal evidence suggests that sustainability-related problems that exist in the supply chains can cause serious financial losses for the focal company (Hoffman et al. 2014, 161).

The source of a risk vary depending on whether they are typical supply chain risks or sustainability-related. Giannakis and Papadopoulos (2016) categorize sustainability-related risks to exogenous ja endogenous risks. Exogenous risks arise from the company's interaction with the external environment within which it operates. Such risks are incurred by companies in their operating environment usually for reasons beyond their control. For example, exogenous environmental risks are driven by external forces such as weather and natural disasters including flood, drought, storms and forest fires. Risks can also be driven by changing political, regulatory and market forces (Wagner and Bode 2006; Ghadge, Dani, Kalawsky 2012, 324). Endogenous risks, in turn, are caused by companies' activities along the chain. Unlike exogenous risks, these risks are completely manageable, or at least partially, if the company has the right practices in place. Activities of the companies affect the surrounding nature and its living organisms in many ways. Thus, environmental risk is a potential or actual threat posed by the company's activities to the environment, for example, resource depletions, waste

creation, contamination and pollution (Rostamzadeh et al. 2018, 654). Thus, environmental risks can also be man-made which stem from the internal factors as shown in the Table 2. The research focuses mainly on the sustainability-related risks posed by the company and its operation.

Table 2. Sustainability-related supply chain risks (adopted from Giannakis & Papadopoulos 2016)

Endogenous	Exogenous
Environmental	
<ul style="list-style-type: none"> • Environmental accidents (e.g. fires, explosions) 	<ul style="list-style-type: none"> • Natural disasters (e.g. hurricanes, floods, earthquakes)
<ul style="list-style-type: none"> • Pollution (air, water, soil) 	<ul style="list-style-type: none"> • Water scarcity
<ul style="list-style-type: none"> • Non-compliance with sustainability laws 	<ul style="list-style-type: none"> • Heatwaves, droughts
<ul style="list-style-type: none"> • Emission of greenhouse gases, ozone depletion 	
<ul style="list-style-type: none"> • Energy consumption (unproductive use of energy) 	
<ul style="list-style-type: none"> • Product waste 	

Endogenous	Exogenous
Social	
<ul style="list-style-type: none"> • Excessive working time; work-life imbalance 	<ul style="list-style-type: none"> • Pandemic
<ul style="list-style-type: none"> • Unfair wages 	<ul style="list-style-type: none"> • Social instability
<ul style="list-style-type: none"> • Child labour/forced labour 	<ul style="list-style-type: none"> • Demographic challenges/ ageing population
<ul style="list-style-type: none"> • Discrimination (race, sex, religion, disability, age, political view) 	
<ul style="list-style-type: none"> • Healthy and safe working environment 	
<ul style="list-style-type: none"> • Exploitative hiring policies (lack of contract, insurance) 	
<ul style="list-style-type: none"> • Unethical treatment of animals 	

Endogenous	Exogenous
Financial/economic	
<ul style="list-style-type: none"> • Bribery 	<ul style="list-style-type: none"> • Boycotts
<ul style="list-style-type: none"> • False claims/dishonesty 	<ul style="list-style-type: none"> • Litigations
<ul style="list-style-type: none"> • Price fixing accusations 	<ul style="list-style-type: none"> • Energy prices volatility
<ul style="list-style-type: none"> • Antitrust claims 	<ul style="list-style-type: none"> • Financial crises
<ul style="list-style-type: none"> • Patent infringements 	
<ul style="list-style-type: none"> • Tax evasions 	

Social sustainability is about how companies impact and interact with the surrounding societies, that is, with people and communities it serves and whose human resources it uses (Svensson & Wagner 2015, 202). Klassen and Vereecke (2012, 103) perceive that supply chain social sustainability issues stem from production processes that affect human health, well-being and community development. Social sustainability risks frequently focus on employees (Anderson & Anderson 2009, 30), more precisely, unfair and inequitable treatment of workers, communities or people in foreign lands (Anderson 2006, 68). The most often criticized social sustainability issues include child labour, insufficient safety regulations, earnings below the legally guaranteed minimum wage, suppression of labour unions and/or their formation, discrimination and unreasonable working hours (Preuss, 2001; Graafland, 2002; Kogg, 2003; Beske, Koplin, Seuring 2008, 65) as shown in Table 2. Such issues might be perceived by the company's stakeholders socially undesirable action. Kim and Wagner (2019) describe aforementioned issues as process-related risks, which arise from supplier's ethical/moral violations of worker's rights. The risk does not appear in the product itself but in the process and conditions under which the product is manufactured and produced.

Financial risks caused by a company's operations include, for example, bribery, false claims, patent infringement and tax evasion. Thus, the company or its supplier seeks to gain a competitive advantage and/or financial benefit through dishonest behaviour. Financial and economic risks can be the result of a supplier's sustainability violations that can be realized as lost sales and operating losses due to, for example, product boycott by stakeholders after the sustainability violation have occurred. At worst, however, economic risk can be a costly legal obligation (Carter & Jennings 2004; Foerstl et al. 2010, 118) in which case sustainability violations can impose sanctions and penalty payments on the company, depending on whether the company is held legally responsible for the event.

There are numerous examples of companies with excellent supply chain management and risk management practices, but who have suffered sustainability-related risks, stemming from their supply chain operations. Since the 90's, major multinational companies like Nike, Disney, Benetton and Adidas have suffered a

backlash that has followed their suppliers' violations of social and environmental sustainability. (Huq, Stevenson, Zorzini 2014, 611) One of the most famous case is the collapse of Rana Plaza garment factory in 2013, which resulted in the deaths of over a thousand-people due to the indifference of the factory managers towards occupational safety. Focal companies make use of a wide network of suppliers, and events like Rana Plaza gave rise to campaigns against purchasing companies because they were seen to be primarily responsible for the events. (Beske, Koplin, Seuring 2008, 64) Similarly, Apple received bad publicity due to negative working conditions that were discovered at one of its supplier's factories in China. (Cellan-Jones, 2012; Zhang, 2012; Hofmann et al. 2013, 161) Events raised widespread criticism among stakeholders because they assume that companies are capable of managing and monitoring the activities of the various parties in their supply chains. (Hofmann et al. 2013, 161)

Sustainability risks are also correlated, and they often go hand in hand with each other. Interrelation of risk variables shows that risks are generally strongly linked one to another, which in turn may affect their priority in the decision making. (Song et al. 2017, 101) Polluting chemicals, use of carcinogenic substances in the products and high carbon emission processes are not only a potential burden and danger to the environment, but also a risk to human health, which can cause product recalls (Gouda & Saranga 2018, 5824). Kim and Vagner (2019) refer to a "product-harm crises" when the product is unsafe to use and can harm the end user's health. Such risks arise from supplier's ethical/moral misconduct in undermining product quality and safety. As an example, over a decade ago an American toy manufacturer, Mattel, announced a recall of nearly one million lead-tainted toys manufactured by Chinese suppliers (Casey, 2007; Kim and Vagner 2019, 73). Such issues will most likely decrease sales and profits as well as a weaken brand and company image. Argued by Lemke and Petersen (2013, 413) reputational risk is often overlook by supply chain managers who rather focus on risks which have the potential to disrupt supplies. However, recovering from a ruined reputation can be difficult and no insurance is available to compensate for loss of revenues. (Anderson 2006, 66) Companies are aware of sustainability risks, but recurring events such as unsafe working environment or human rights violations show that traditional risk management methods fail to address and overcome

sustainability-related risks in supply chains. Albeit sustainability issues are the fundamental part of purchasing decision of multinational companies, social and environmental sustainability considerations must become a key part of sourcing decisions and risk management of every company.

2.4 Supply chain risk management

The risk management has become a particularly important aspect in sustainable supply chain management as increased sustainability requirements have broadened the definition of the traditional supply chain. In the significantly changing business environment, the traditional way to manage the supply chains no longer work and old supply chain models no longer serve the present need. (Christopher and Gaudenzi 2015, 58) Moreover, increased outsourcing and offshoring has increased supply chain vulnerability, exposing companies to higher level of risk. (Trkman and McCormack, 2009; Song, Ming, Liu 2017, 100) Many businesses are expanding their operations to reduce operating costs, but while doing so, they expose themselves to risks happening far away in their supply chain. The reputation and image of companies can be at stake due to suppliers who do not adhere to the principles of sustainability in their own operations. Risk factors can also be a natural disaster on the other side of the globe, which can jeopardize the business of the focal company. (Ellis et al., 2011; Rostamzadeh, Ghorabae, Govindan, Esmaeili, Nobar 2018, 652) Systematic, well-designed risk management not only benefits the focal company, but also brings opportunities for all parties in the chain by providing competitive advantage and sustainable benefits (Teuscher, Grüniger, Fernidand 2006; Morali, Searcy 2012, 638). The essence of risk oriented SSCM is the partnership between supply chain organizations, which enables the reduction of risks inherent in the nature of the supply chain (Teuscher et al. 2006, 3). In fact, it is argued that an organization that ignores risk management while pursuing efficiency is doomed to failure eventually (Dong and Cooper, 2016; Fan et al., 2016; Rostamzadeh et al. 2018, 652) Long-term strategic and business benefits in mind, the elimination of risk and managing them in the supply chain is vital in order to materialize sustainability throughout the chain.

One of the most common ways to carry out risk assessment is to use a risk map/matrix, which is used to assess the likelihood and consequences of risk occurrence to the supply chain performance. The company should focus on risks which are comparable and quantifiable so that risks can be prioritized based on their impact on the supply chain vulnerability (Blackhurst et al. 2008; Vilko & Hallikas 2012, 587). However, the focus should not be solely on financial consequences i.e. tangible, quantifiable assets. Other issues to be considered are, for example, credibility, reputation, status, authority and trust can be damaged if a risk is realised (Harland et al. 2003, 54). Different scales and charts can be used in risk assessment and Table 3 and 4 present the five-class scale which are used to assess the consequence and probability of the risk.

Table 3. Impact assessment scale (adopted from Hallikas et al. 2004)

Rank	Subjective estimate	Description
1	No impact	Insignificant in terms of the whole company
2	Minor impact	Single small losses
3	Medium impact	Causes short-term difficulties
4	Serious impact	Causes long-term difficulties
5	Catastrophic impact	Discontinue business

Table 4. Probability assessment scale (adopted from Hallikas et al. 2004)

Rank	Subjective estimate	Description
1	Very unlikely	Very rare event
2	Improbable	There is indirect evidence of event
3	Moderate	There is direct evidence of event
4	Probable	There is strong direct evidence of event
5	Very probable	Event recurs frequently

Assessing risk is a complicated process and the risk of one company is not necessarily a risk to another company. Hence, the assessment is subjective and should be done from the company's own point of view. (Hallikas, Karvonen, Pulkkinen, Virolainen & Tuominen 2004, 53)

Supply chain risk management (SCRM) is a preventive and proactive way of managing risks to avoid any unfavourable situations or to minimize the risk. Moreover, the aim of the process is to determine, implement and monitor measures to avoid, defer, reduce or transfer all relevant risks. (Hofmann et al. 2014, 162) Supply chains can vary greatly in size and nature, but they should be able to react quickly to external and internal risk incidents and at the same time be profitable and productive. Hence, companies should seek solutions where supply chains are flexible to unpredicted disastrous matters (Rostamzadeh 2018, 652) and resilient enough to respond to events as they happen. (Christopher & Gaudenzi 2015, 71) SCRM is a collaboration of supply chain partners which is carried out with the risk management tools and practices. (Norrman & Jansson 2004, 436) The risk management tool itself does not guarantee that all potential risks can be detected or that consequences can be properly resolved, but it standardize risk management of the organization and supports it with risk events. For the risk management to function smoothly, knowledge, abilities, experiences and skills are needed. (Wu & Blackhurst 2009) Risk management may deal with risks for a single company, but generally risk management considers at least two supply chain organizations (buyer and supplier) or, preferably, a supply chain of three or more companies, i.e. the buyer and the first tire and the second tire supplier.

A variety of supply chain risk management tools are used to evaluate and distinguish different supply chain risks while operating at the same time cost-effectively. In academic field, there has been introduced various risk management frameworks using different terminologies. Even if there is no agreement on the definition of SCRM, there is a consensus of the main stages involved in supply chain risk management which are risk identification, assessment, analysis, treatment, and monitoring (Giannakis & Papadopoulos 2016,456). Managing sustainability-related risks follows the same principles and logic as managing typical supply chain risks. The objectives of the risk management frameworks, however, differ depending on whether the target is a typical supply chain risk or a sustainability-related. Risk management strategies that focus on the most common problems in the supply chain tend to harmonize supply chain and reduce complexity, lead times, minimize costs and optimising operational efficiency. In turn, by addressing sustainability-related risks, the goal is to avoid negative

consequences for the company's reputation and image or shareholder value. (Anderson 2005; Giannakis & Papadopoulos 2016, 458)

Anderson (2006, 70) perceive that the objectives of sustainability risk management are cost-oriented which enables the company to reduce risk-related costs. Companies that have managed to reduce their sustainability risks, such as the amount of waste and pollution, have also reduced the cost of waste treatment. For example, by reducing pollutants and greenhouse gas emissions from diesel, Fedex managed to reduce the risk of reputation, boycott and regulatory risk. However, the primary purpose of sustainability risk management is not aimed at managing and minimize costs, but also to create value, which can improve the supply chain's sustainability (Giannakis & Papadopoulos, 2016; (Valinejad & Rahmani 2018, 56). Irrespective of the distinctive nature and of sustainability-related risks, their management process should be included in the company's overall risk management strategy, as the sustainability risk can be a forerunner for a typical supply chain risk, for example, an environmental disaster may cause a risk of delivery difficulties (Pullman et al. 2009; Giannakis & Papadopoulos 2016, 458). Effective identification and management of sustainability risks in the supply chain leads to effective resource allocation, which enhances supply chain sustainability. (Valinejad & Rahmani 2018, 55)

2.5 Risk management framework for sustainability-related risks

As sustainability risk management follows the same logic as traditional risk management, Giannakis and Papadopoulos (2016, 457-458) suggest the usage of a risk management model which is similar to traditional risk management model. Figure 4 illustrates the various stages of risk management process of sustainability-related risks.

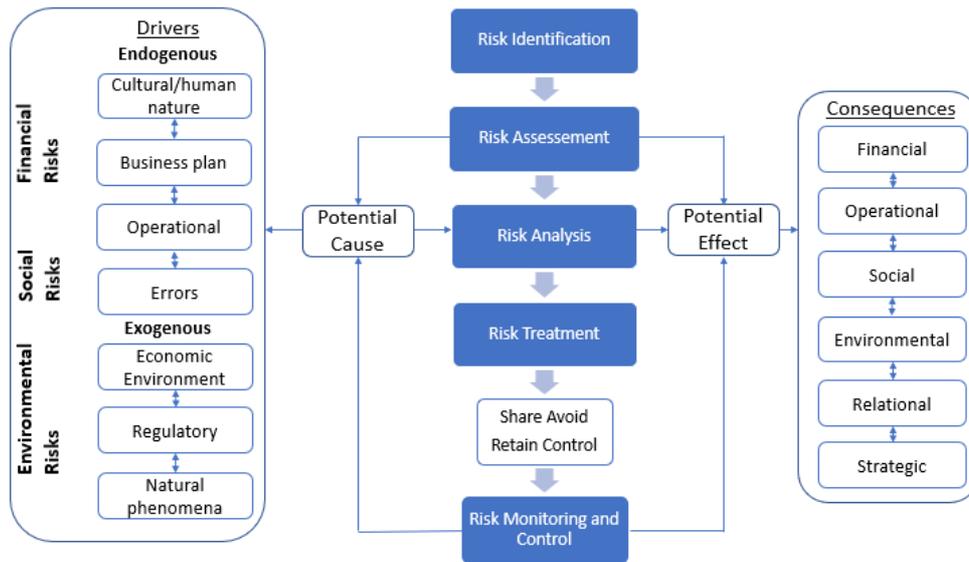


Figure 4. A risk-management framework for sustainability-related risks (Adopted from Giannakis & Papadopoulos 2016, 459)

The first stage of risk management is to identify all possible risks, including the sources and characteristics of risks. (Wu & Blackhurst 2009) Risk identification plays an important role, since if the risk is not identified, it increases the realization of unwanted consequences associated with the risk. Interconnection between supply chain partners means that challenges faced by a single company, such as labour related problems or corruptions, are likely to also affect other parties of the chain. (Kachen & Seuring 2014, 666) Similarly, only by understanding the origin of the risk, the company can take measures to manage the risk. Different methods can be used to identify and analyse the risks, but one of the most important tools is risk mapping, which enables the company to identify the sources of risk and to understand and identify the potential consequences of them. (Norrman & Jansson 2004, 438) In addition, company can employ a risk checklist in which risks are identified based on previous projects and experience of managers. (Song et al. 2017, 100) As potential risks and sources of risks are identified, it is possible to implement appropriate actions to reduce vulnerability and thus become aware of events that may cause disturbances. (Norrman & Jansson 2004, 438) According to Vilko & Hallikas (2012,587), visibility in the supply chain is of the main factors in risk identification. Complex supply chains in the modern world, however, poses a challenge as the visibility of operations outside the company's own functions has

decreased. (Vilko & Hallikas 2012, 586) Harland, Brenchley and Walker (2013, 59) identified that less than 50 per cent of the risks that could potentially affect the focal company were visible. Therefore, companies should pay focus on identifying risks outside their own functions in the supply chain. Simplest way to improve risk identification is to increase co-operation in the supply chain, which in turn facilitates risk management.

After the risks have been identified, the likelihood and impact of the risks on the supply chain performance is assessed. Risk analysis prioritises risks based on their importance, after which their root causes can be identified. This can be done by brainstorming or by doing conclusions or generalization based on an individual case or controlled experiments. (Giannakis & Papadopoulos 2016, 457) It is essential to evaluate and prioritize risks in order to implement appropriate measures and management actions. After risk assessment, it is possible to take measures to prevent or control the risk. Risk management is a measure by which a company takes action to reduce the consequences or probabilities of a risk. For the success of risk management, it is important that the origin and nature of the risk are well known as well as the probability of realization of the risk. Risk management is not an easy task and supply chain leaders should decide where to allocate scarce resources and what strategies should be used. All risks cannot be avoided but they can be managed, and the company should use a variety of approaches. (Gillett 1996; Harland et al. 2003, 54) Several best practices have been presented for risk management and some of the practices focus on reducing the causes of the disruption (cause-oriented risk management) and some focuses on adverse effects of disruptions (effect-oriented risk management). (Hofmann et al. 2013, 161) However, risk management measures vary according to risk, and for each sustainability-related risk, Giannakis & Papadopoulos (2016, 465-467) outlines measures which can be used to avoid or mitigate risk, for example, supplier collaboration. Table 5 provides a more detailed definition of sustainability-related risk and risk management measures.

Table 5. Sustainability-related risk definitions and management (adopted from Giannakis & Papadopoulos 2016)

Sustainability risk	Definition	Practices
Social (endogenous)		
Child/forced labour	Work that deprives children of their childhood, and is harmful to physical and mental development	<ul style="list-style-type: none"> • Avoid investment in regions with poor record for child labour • Develop and apply responsible sourcing policy • Work closely with suppliers
Discrimination	Prejudicial treatment of an individual based on their membership in a group or category, in a way that is worse than the way people are usually treated	<ul style="list-style-type: none"> • Generate practices for equal opportunities • Formalize complaint handling system to act swiftly to allegations • Employ legal services to deal with equal opportunities
Unfair wages	Unfair payment to employees	<ul style="list-style-type: none"> • Apply laws for minimum or fair wage • Engage with suppliers, industry bodies, NGOs to monitor wages

Sustainability risk	Definition	Practices
Environmental (endogenous)		
Pollution	Air, water or soil contamination due to facility operations or products	<ul style="list-style-type: none"> • Locate facility away from urban areas • Design contracts to prevent pollution • Sustainable waste management/disposal
Excessive product waste	Unusable or unwanted substance or material producing during, or a result of a process, such as manufacturing or transportation	<ul style="list-style-type: none"> • Recycle • Sustainable waste management/disposal • Apply lean management practices
Packaging	Failure to comply with the packaging standards or excessive packaging	<ul style="list-style-type: none"> • Use sustainable packaging • Design products requiring less packaging

Sustainability risk	Definition	Practices
Economic (endogenous)		
Antitrust claims	Claims arising against a company that violates competition laws (cartels, price gouging, refusal to deal, tying, predatory pricing)	<ul style="list-style-type: none"> • Avoid investment in unstable regions • Build relationship with local communities • Monitor flow of resources from unstable areas • Build extra capacity
Bribery/corruption	Offer (or accept) money or gifts to a potential client (from a supplier) in exchange for business	<ul style="list-style-type: none"> • Adopt antitrust principles to recognize when an problem is possible • Work with potential suppliers to interpret law
False claims/dishonesty	A deception deliberately practiced by an individual or a corporation in order to secure unfair or unlawful gain	<ul style="list-style-type: none"> • Avoid countries with poor transparency record • Implement compliance programme to detect corruption, introduce whistleblowing systems • Monitor conduct of third parties/agents
Tax avoidance/evasion	Tax liability minimization that occurs from a sound financial plan/illegal attempt to reduce the tax amount by fraudulent means	<ul style="list-style-type: none"> • Develop and implement compliance procedures with EU laws • Establish reputation Management programme

Giannakis and Papadopoulos (2016) argue that successful risk response aims to prevent, mitigate, transfer, avoid risk. To put in a simple term, the most common practices for managing risks are risk transfer, risk taking, risk elimination, risk reduction and further analysis of individual risks. (Hallikas et al. 2004, 54) In an operating environment with a number of companies involved, one way to manage risks is through collaboration. Cooperation between the various parties is important, but some of the risks must also be managed by an individual company. Companies in the network can transfer risks to each other if the company transferring the risk estimates some other company can cope with the risk better than itself. Similarly, a common practice for companies is to share the risk with another organization of the supply chain. Risk sharing mechanism is a common practice whereby the various actors in the supply chain share responsibility for risk reduction and the potential consequences of supply chain risk. (Juttner, 2005; Kleindorfer and Saad, 2005; Li, Fan, Lee, Cheng 2015, 84) Risk pooling between a focal company and suppliers is a good way of sharing responsibility and reduce uncertainty. (Kache & Seuring 2014, 670) When the risk is decentralized, all parties bear equal responsibility. Cooperation between companies and careful selection of partners plays an important role in risk management. Sometimes the focal company accepts the fact that not all risks can be affected or alternatively they make an informed decision and accept the risk and turn a blind eye, hoping that an adverse event will not occur. (Hajmohammad & Vachon 2016, 48) Similarly, risk taking, and any resulting damage can be considered a less expensive option than making possible corrective measures and strategies.

Companies operate in an ever-changing environment and thus risks should be monitored because their status changes as well. By monitoring the risk, it is possible to detect any upcoming changes in the consequence or probability of the risk. Some risk may not be a problem for the company at the moment, but the situation may be another in the future. It is also possible that new risks will emerge in the future. Thus, companies should monitor the changes in the network, customer needs, technology, partner strategies and competitors and to update the risk assessment correspondingly. (Hallikas et al. 2004, 54) Moreover, by utilizing a systematic risk management tool (Figure 4), a focal company /can prioritize sustainability risks based on their impact and probability. However, the focal company is best placed

to influence risk reduction by managing its supplier network where the sustainability risks often stems from.

2.5.1 Sustainability-related risk management in supply chain

Sustainability-related risks have received a growing attention in the field of supply management, and it is part of the wider concept of sustainability risk (Hofmann et al. 2014; Hajmohammad & Vachon 2016; Kim, Wagner, Colicchia 2019). It is often associated with reputational risk as a result of supplier misconduct which becomes public (Chen & Lee 2017, 2795). Hence, sustainability-related risk is a sustainability-related condition or a potentially occurring event, which stem from the focal company's supply base, that may provoke harmful stakeholder reactions (Hofmann et al. 2014; Hajmohammad & Vachon 2016, 49). If such risk become public, it will pose a damaging effect to a focal company as it has to bear the responsibility of its supplier' ethical/moral misbehaviour (Kim and Wagner 2019, 71) The aforementioned risks of social sustainability are usually the source of the sustainability-related risk, most commonly the rights of employees such as discrimination and unfair wages, which stakeholders may view socially undesirable. Such risks usually stem from the supplier's operation. Similarly, product quality problems and product safety problems could trigger sustainability-related risk (Kim et al. 2019, 73). The sustainability-related risks may have a damaging effect if the purchasing company is seen as responsible for its supplier's ethical and moral misconduct (Kim et al. 2019, 71). Such risks may also manifest themselves as product boycotts or customers cancelling their orders or at worst disruption in the supply chain (Hajmohammad & Vachon 2016, 50). Managing sustainability-related risk is essential since one weak partner in the supply chain can paralyze the entire chain and can prove disastrous for all participants. The above-mentioned sustainability-related risk measures (see Table 5) require a lot of cooperation between the focal company and the supplier for effective and successful risk management. If the focal company does not have production in its own hands, it must be able to create a set of rules for its supplier, as environmental, social and economic issues can arise specifically from the supplier base.

Globalisation allows companies to work with a variety of suppliers and to obtain raw materials and preliminary products from different sources. Increased global production and complex supply chain network with growing number of potential suppliers have made focal companies more dependent on the performance of their upstream suppliers. Similarly, first tier suppliers' production is often dependent on the performance of the downstream supply chain organisations. (Koplin, Seuring & Stefan 2007, 1053) Such structure and increased dependency has made companies to address more extensively supplier perspective in their risk management (Hallikas et al. 2004; Wagner & Bode 2006; Foerstl et al. 2010, 119). In order to effectively implement risk management measures and strategies, sustainability risk management should be closely linked to key supplier management processes, that is, supplier selection, evaluation and supplier development (Craighead et al. 2007; Koplin et al. 2007; Foerstl et al. 2010, 119). Sustainability-related risks assessment and management enables effective sustainability risks mitigation measures, which in turn reduce company exposure to reputational risks and adverse publicity. Giannakis and Popodopoulos (2016, 457-458) argue that companies have five different ways to respond sustainability risks which are identify, assess, analyse, treat and monitor. To manage above mentioned sustainability risks and supply chain sustainability, companies must focus on supplier sustainability management and collaborate with suppliers that contribute to the sustainability of the supply chain and corporate sustainability goals. A successful sustainability-related risk management include supplier sustainability management.

Suppliers have many reasons not to comply with the requirements of the focal company which at the worst can create a huge risk for the focal company. According to the findings of Villena and Gioia (2018, 10), lower-tier suppliers generally have a low risk of being penalized if they fail to meet social and environmental sustainability requirements. Even when such suppliers have been on the radar of NGOs, the risk of being penalized have been low. Moreover, suppliers often operate in countries where legislation is less demanding than in Western countries in terms of environmental requirements and social sustainability. Thus, suppliers do not feel the pressure to develop the responsibility of the operations when the requirements of the legislation are at the minimum, allowing them to focus on profit dimension.

Also, without proper incentives, suppliers might have the temptation to avoid sustainability requirements of the focal company by citing the high costs they bring. (Huq et al. 2016; Villena 2018, 11)

Supply chain sustainability is the responsibility of all parties in the supply chain, but the reputation of the focal company is at stake even if the actual sustainability risk stems from the supplier side. In the eye of a public, focal company is responsible for their products and their supplier's wrongdoings regarding environmental and social issues (Beske, Koplin, Seuring 2008, 64). Generally, suppliers do not have a well-known brand that consumers would know and correspondingly they have no direct contact with the end-consumer of the product, thereby they often go unnoticed. (Foerstl, Azadegan, Leppelt, Hartmann 2015, 68) Unsustainable business practices of suppliers create a significant potential risk for a company which can damage both reputation and business continuity. (Canzaniello, Hartmann, Fifka 2017, 387) Thus, avoiding business relations with a supplier whose operations are characterized with unsustainable elements, such as, unsustainable technology or processes is essential in the management of sustainability risks. Similarly, identifying and assessing risks at the suppliers' end help the focal company increase awareness and develop the sustainability of the operations at the supplier's end. This in turn allows them to sell high quality products that meet legal requirements which will not expose them to sustainability risks (Gouda & Saranga 2018, 5824)

2.5.2 Supplier assessment and selection

In the management of sustainability-related risks, it is essential to select a supplier that does not jeopardize the implementation of sustainability in the supply chain and avoiding activities that may expose the focal company to a risk. (Miller 1992; Giannakis & Papadopoulos 2016, 458) Supplier assessment is an essential factor in reducing upstream supply risks (Matook et al. 2009; Tang 2006; Foerstl et al. 2010, 119). The first goal of the practice is to avoid sustainability risks that may stem from interruptions in practical actions such as operational processes or sustainability performance of a supplier. Constantly changing legislation and increasing pressure from stakeholders and NGOs put companies to consider the

role of supplier misconduct in risk management. In the field of risk management, this practice is known as risk avoidance, in other words, avoiding business relation with unethical/risky suppliers. Thus, focal company eliminates the source of the risk. In 2013, Walmart International Limited, the world's biggest palm oil trader decided to cease a trade relation with its Indonesian suppliers due to unsustainable environmental impacts and violations of the law. (Hajmohammad & Vachon 2016, 50)

To avoid working with risky suppliers, companies must be able to assess suppliers' activities. Supplier assessment plays a significant role in reducing upstream supply chain risks and provides the company with a strategic alternative to what needs to be done in terms of risk. (Matook et al., 2009; Tang, 2006; Foerstl, Reuter, Hartmann, Blome 2010, 119). Companies employ various sustainability standards and principles to determine the sustainability level of the supplier's operations. Increasingly, these standards are embedded in the selection and evaluation process of suppliers (Walton et al., 1998; Vachon & Klassen 2006, 799). Moreover, it helps to assess risks associated to the supplier's operation. The most common way to manage sustainability risks is to set minimum standards for the different areas of sustainability according to which different supply chain operators are expected to act. Argued by Teuscher et al. (2006, 6), standards support risk management, guarantee compliance and reporting and motivate for continuous improvement. By applying international standards in their own activities, companies show that they take responsibility for promoting sustainable development. Sustainability standards include Global Compact, SA 8000, ISO 14001, ILO Conventions and GRI Guidelines to mention a few. Sustainability standards have been created to apply to a variety of companies, regardless of industry, and are based on international agreements.

Regarding of social sustainability, standards are still in its infancy, for which reason companies have created their own set of standards, also known as Code of Conduct (CoC) which is most common ethical standard practice for focal companies. It further clarifies how supply chain partners are expected to act and what their responsibilities and restrictions are. (Lückerath-Rovers & De Bos 2011, 469) Code of Conduct also set a minimum level of improvement to create more

sustainable products (Harms et al. 2013, 208). In order to minimize sustainability risks, some companies oblige their (tier 1) suppliers to ensure that the (tier 2) suppliers comply with the sustainability principles of the purchasing company (Villena 2018, 1). In some cases, focal companies have direct contact only with the first-tier supplier, but not necessarily with a second-tier supplier. If the focal company no longer knows lower-level suppliers, it creates a potential risk as different parties in the supply chain are not known and thus the company is unable to identify potential problems in the supply chain (Beske, Koplin, Seuring 2008, 65). Therefore, at the contract stage, focal companies oblige their suppliers to ensure sustainability when it comes to lower level suppliers. They can ask their suppliers for labels and certificates which authenticate compliance with company sustainability policies. (Harms et al. 2013, 208)

Code of Conduct also acts as a screen in supplier selection. It enables the purchasing company to understand the basic ethical principles of the supplier and to decide whether to cooperate with the supplier or not. If the supplier does not adhere sustainability principles, it poses a risk to the company's operations. The primary objective of the Code of Conduct is to avoid the risks associated with all three dimensions of sustainability (Seuring & Müller 2008, 1704). Code of Conduct not only seeks to prevent the expression of sustainability risks in the supply chain, but also demonstrates the commitment to sustainability to the company's stakeholders and thus supports the transparency of the supply chain.

Management systems and standards, however, do not remove supply chain risks, but they provide the basis for managing sustainability risks and can reduce supply chain sustainability risks. (Anderson 2006, 72) Standards inherently have already removed some possible sustainability related risks and conflicts that might arise in the supply chain. Different management systems, such as, ISO 14001 (environmental sustainability) or SA 8000 (social sustainability) play a key role in this regard which contribute to developing a sound risk management system. The adoption of standards can be viewed as a means to protect brand image from various risks stemming from the supply chain. (Fombrun et al., 2000; Klassen & Vereecke 2012, 113)

2.5.3 Supplier monitoring and audits

Suppliers form an important part of the supply chain, but they are also perceived to be one of the biggest contributors to the risk events. To mitigate disruptions and risk event, some companies regularly visit and monitor suppliers' premises to reduce the occurrence of a risk event. (Gouda & Saranga 2018, 5822) Contrary to the traditional risk monitoring, sustainability-related risk monitoring may include assessing sustainability performance of supply chain members. Supplier monitoring generally means evaluating and measuring the performance or process of the supplier against particular performance criteria in order for the focal company to verify the supplier's compliance with its requirements (Jiang 2009; Hajmohammad & Vachon 2016, 50). Monitoring is a risk prevention and mitigation practice in the supply chain which also aim to verify that the supplier complies and promotes the sustainability goals of the focal company. Supplier monitoring is essential to ensure product sustainability and thus companies can avoid potential reputational risks that may occur as a result of irresponsible behavior of the supplier, as the previously mentioned company examples showed. Due to supplier environment and social sustainability violations, large multinational companies such as Apple and Nike have started to actively monitor their suppliers for their labour practices. (Klassen & Vereecke 2012, 103)

To ensure adherence to sustainability expectations and manage possible social and environmental risks, companies monitor their suppliers. Due to scarce resources, monitoring is primarily about supplier information gathering which enables supplier performance evaluation and assessment. Data gathering can be based on public information, or the information can be obtained from company-specific surveys or through audits conducted by the buyer or an independent third party. (Min and Galle, 2001; Vachon & Klassen 2006, 798) For environmental sustainability aspects, the supplier may be required to report all chemicals used in the manufacture of a component or to verify that the labour practices correspond to the SA 8000 criteria. Thus, audits consider a number of different requirements and compliance. Audits will ensure, among other things, that the supplier acts in accordance with, for example, environmental laws and that it has all the required documents up to date and correct (Vachon & Klassen 2006, 798). Social audits

typically involve reviewing the supplier's labour standards and labour contracts and documents which clarify working hours and company labour policies (Huq, Stevenson & Zorzini 2014, 623)

An important part of the monitoring is also the on-site audit, which the companies do either themselves or by using an accredited or independent third party auditor. The characteristic of auditing is to find out at what level the supplier's practices correspond to the law, the company's own sustainability policies and the customer's sustainability requirements. Thus, auditing assesses the "alignment of social outcomes with responsibilities as defined by stakeholders". (Klassen & Vereecke 2012, 112) Similarly, a common practice is to use certification provided by an independent third party, who issues a certificate to a supplier that demonstrates compliance with a number of sustainability-related principles. Fair Trade, for example, provide certificates in agricultural sector to farmers who, for example, apply environmentally friendly cultivation methods and pay fair wages to their employees, while respecting the safety of the working environment. (Awaysheh & Klassen 2010, 1247)

2.5.4 Supplier collaboration

An essential part of risk management of sustainability risks is the cooperation between focal company and its supply chain partners. The objective for many focal companies is to develop a long-term partnership with suppliers who are not risk-averse and therefore businesses are better off in an ever-changing business environment. (Hartley and Choi, 1996; Matook, Lasch, Tamaschke 2009, 242) A collaborative business relationship can help companies implement better and more efficient supply chain risk management practices (Lavastre et al., 2014; Li et al. 2016, 84). As mentioned earlier, increased global production has made purchasing companies more dependents on upstream suppliers' performance which has prompted companies to understand the importance of supplier collaboration in risk management. (Hallikas et al., 2004; Wagner and Bode, 2006; Foerstl et al. 2010, 119). It is argued that many risks in sustainable supply chains are due to lack of good partnership between supply chain organizations (Gallear and Ghobadian 2004; Teuscher et al. 2006, 5) and thus collaboration has been identified as a

critical factor of creating sustainable supply chain. (Pagell and Wu 2009; Touboulic and Walker 2015, 178). IKEA, for example, collaborate with its supplier to mitigate the risk across the supply chain and thus improving suppliers' knowledge and understanding of sustainability-related issues (Hajmohammad, Vachon 2016, 51).

The reason for supplier collaboration varies from one company to another, but argued by Grimm, Hofstetter and Sarkis (2016, 1972), the underlying factor for the cooperation is usually the weakness in the supply chain that needs to be corrected. Collaboration is a risk-mitigation practice which encompasses a broad range of activities, such as, workshops, training programs, transfer of employees and investments, all known as supplier development programs (Grimm et al. 2016, 1972). Collaboration requires the will of both parties and the ability to devote specific resources to develop cooperative activities. The focal company's sustainability requirements may incur extra costs for the supplier, increasing the risk of non-compliance. However, as part of collaboration-base risk mitigation practice, the focal company can compensate the supplier's sustainability compliance costs, for example by joint investing in environmentally friendly technology or cultivation methods. (Hajmohammad, Vachon 2016, 51) Moreover, collaboration may include joint planning sessions, knowledge sharing activities aimed at achieving more sustainable products or reduce environmental impact of the supply chain through waste management. Such collaboration requires exchange of information and a common desire and willingness to learn from each other's activities in order to set goals for the improvement. (Vachon & Klassen 2008, 301)

Whereas supplier assessment and monitoring are more focused on supplier's social or environmental performance assessment and information gathering, collaboration and partnership between the focal company and the supplier focus more on process development and corrective actions. Over time, the relationship between the focal company and the supplier can become a close partnership based on joint problem-solving and developing capabilities of both parties where the focus shifts from short-term outcome to long-term goals and cooperation (Vachon and Klassen 2006, 799) The partnership can also be annual meetings which foster active discussion of emerging trends of, for example, regulatory requirements. Knowledge sharing

undermines potential sustainability risks in global supply chains and free up resources for other activities, as supplier does not need to investigate new regulatory requirements. (Klassen & Vereecke 2012, 111)

Collaboration between the focal company and the supplier contributes to the risk management, but there is no consensus on the most effective joint supply chain risk management practice. However, Li et al. (2016, 91) perceive that risk information sharing and risk sharing mechanisms support supply chain risk management and without them many modern risk management practices would not be possible. (Christopher and Lee, 2004; Norrman and Jansson, 2004; Sheffi and Rice, 2005; Li et al. 2016, 91). In particular, they argue that risk information sharing is most effective when there is a long-term business relationship and the company has supplier's trust. When a company works with a long-term and a trusting supplier, the flow of information on supply chain risks is likely to be faster and more thorough, supported by personal ties and informal communication between the supply chain members.

In turn, risk sharing mechanism is the most effective when both parties have a high level of shared understanding on supply chain risk management. Risk sharing is not so much based on personal relationships and building close relationship with supply chain partners. Instead, it is based on contractual agreements which clarify supply chain members' duties and obligations. When companies adopt risk sharing mechanism, they could spend less time on negotiation and thus reach consensus on shared obligations and responsibilities more quickly. Moreover, when risks are being shared, supply chain partners work more efficiently when solving supply chain risk related problems. Therefore, the focal company should pay attention to the potential benefits of supplier collaboration as it can significantly help to mitigate supply chain risks. (Christopher et al. 2011, 71)

3 METHODOLOGY

The previous part of the research outlined the observations made by earlier studies on the topic. The upcoming part lays open the fundamentals of the research; how the research was conducted, what methods were used and how empirical data was collected. The last part of the chapter outlines the reliability and validity of the study.

3.1 Research methods and design

Research methods refer to systemic, focused and orderly collection of data, with the purpose to provide material which answers to research questions. For this research, explanatory research method was used since the research sought to answer to question "how". Yin (2014, 9) argue that research questions, which are built around the word "how" are generally explanatory Case studies. In general, data collection methods can be described as quantitative and qualitative methods which differs in terms of data collection techniques and data analysis procedures. Quantitative research generally refers to research that generates numeric data. In turn, qualitative research method refers to a data collection method or data analysis method that produces or uses non-numeric data (Baxter & Jack 2008, 151). The aim of the qualitative research is to gain insights and create new knowledge. Qualitative data also increase understanding of an interesting issues. Qualitative research is based on the researcher's own observations and interpretations of the phenomenon. The aim is to produce empirical material for the study in question (Eriksson and Kovalainen 2008).

A Case study research is conducted when the researcher wants to understand a real-world case. Many Case studies are conducted by using qualitative data since it fits well in in-depth investigation of a phenomenon. (Farquhar 2012) Moreover, research questions such as "how" and "why" are explanatory and likely to lead to use of Case study (Yin 2003, 10) A Case study in itself aim to develop an in-depth analysis of single or multiple cases (Miller 2007, 6) which are contemporary (Yin 2003, 16). In qualitative data collection, interviews are often used to collect the data. Often semi-structured interviews are used, which means that the interview progresses according to the interview frame, but allows flexibility (Farquhar 2012).

In semi-structured interview, the researcher will have a list of themes and questions to be covered, although these may vary from interview to interview (Baxter & Jack 2008, 320-322). In addition, interviews will enable a broader and deeper analysis of the topic.

Interviews can be carried out face-to-face, via telephone, or through an instant messaging program such as Skype. According to Farquhar (2012) the interviewer's task is to "to create a situation that encourages the informant to talk about the subject of the research". At best, an interview can bring a lot of new and useful information to a research topic when the questions are carefully planned, and the interviewees are correctly selected. However, the interview itself can be challenging situation as the interviewer should be able to keep the conversation going and make sure the interviewee stays on topic and responds well enough to the research questions. Once the research method is selected and the data collection method is chosen, the researcher should decide who to interview as part of the research. Figure 5 shows a more detailed research process of this specific study. The interviewees should be able to provide the information needed to conduct the research (Farquhar 2012).



Figure 5. Research process (Adopted from Soy 1997)

3.2 Case companies

The companies selected for the research are a globally operating companies with both domestic and foreign suppliers. Case companies differ by the size of the operation and by the industry. Four out of eight companies are food industry operators whose supply chain may include more than a hundred of suppliers. One of the Case companies has more than 1500 suppliers. Companies chosen for the research operate at the different point in the supply chain, for example, as a manufacturer, retailer or as a wholesaler. Some companies have their own production facilities located in Finland or elsewhere in Europe. They either sell their own products or brands of other companies to various business customers/ consumers.

Some of the Case companies are part of a larger group under which they operate. Thus, the goals of sourcing and sustainability may stem from the group level, which are then implemented in the day-to-day operations of the subsidiaries. However, this does not mean that the Case company itself cannot do more than what is required at group level. Similarly, companies also carry out sustainability work that goes beyond legal obligation. Risk management is sometimes guided by statutory requirements which forces companies to practice, for example, traceability throughout the chain. The overall implementation of risk management depends on a number of factors, such as the ability of the focal company to influence on the suppliers' operations. Similarly, the risks vary by product category and Case company F interviewee mentioned that there are high-risk product groups and low-risk product groups. The following paragraphs deal with the sustainability risks identified by the Case companies and how those are managed in practice. The role of supplier collaboration in managing sustainability risks is also discussed.

3.3 Data collection

The empirical data of the research was collected by interviewing Finnish purchasing, supply management and sustainability experts from different industries. The data collection was carried out in the form of face-to-face interviews which were held at companies' premises. Most of the interviews were approximately

1,5 hour long and were recorded to facilitate the analysis work. Recording of interviews also allows researcher to return the original material when necessary. The data collection was carried out as part of the LUT University research purposes and the companies interviewed were predetermined by the LUT University researchers. The common factor between the chosen Case companies is that they are domestic companies with an interest to practice sustainable sourcing and supply chain management. These Case companies were selected for the study, since most companies have developed their sustainability work over the long term, some for up to a decade, and integrated it as part of their overall strategy. This was important in order to obtain the most comprehensive research material as possible. In addition, the companies find supplier cooperation as a cornerstone in their supply chain risk management. Sustainability work is seen as an important part of business operations and is understood to include social, environmental and economic aspects. Sustainability can also give a company a competitive advantage in the market, but it is seen above all as a good business practice which is the only right way to do business in a modern world.

For the empirical part of the research, semi-structured interviews were used to collect the data. Such data collection method can be used for both “what” and “how” questions (Eriksson and Kovalainen 2008). Table 5. present the list of the companies interviewed for the research.

Table 6. Case company interviews

Case company	Number of interviewees	Duration of the interviews
Case company A	2	1 h 40 min
Case company B	2	1 h 30 min
Case company C	2	2 h 25 min
Case company D	3	2 h 04 min
Case company E	2	1 h 10 min
Case company F	1	1 h 20 min
Case company G	1	1h 25 min
Case company H	2	1 h 30 min
Total	15	

The interview questions were formulated so that they are as clear and comprehensible as possible. The structure of the interview covered different themes related to sustainable sourcing, of which risk management was one of the areas. In total, interview form included nine different themes and approximately 40 questions. Before the interviews, all the questions were sent to the interviewees beforehand. However, the interviewees were instructed that they do not have to prepare for the interview.

The interviewees were selected for the study based on their knowledge and experience of the research topic. This would ensure that the research data to be collected would be as informative and comprehensive as possible. However, some of the interviews were short because the interviewees did not have sufficient knowledge of the subject. Therefore, during the actual interview some of the questions were omitted depending on the interviewee's capabilities and knowledge of the subject. In some cases, the interview of one Case company had to be organized in two parts because, for reasons of scheduling, it was not possible for both interviewees to arrive at the same interview. In this case, questions were selected from the interview form based on the competence of each interviewee.

Along the interview, additional questions were asked in addition to pre-defined questions. As the interview structure associates with different business operations, more than one person was sought to be interviewed from the Case company. The companies and interviewees chosen for this particular research were interviewed in their mother tongue, Finnish language. Interviewees are mainly responsible for developing and implementing their organizations sustainability work or procurement activities.

3.4 Data analysis

Analyzing qualitative research data is usually more challenging than quantitative data (Eriksson and Kovalainen 2008), since the data is interpreted on the basis of words and sentences rather than numerical, measurable facts. To ease the data analysis process, all the interview tapes were transcribed. This also enabled researches to return to the interview material when needed. In total, transcription

was as extensive as 158 pages. As the interview form dealt with other topics that were not relevant to the research, the main themes were highlighted from the transcription, based on their relevance to the research topic. A comment of a specific theme was highlighted in its own color so that different themes were clearly distinguished from each other. There were a total of four themes: sustainability-related risks, managing sustainability-related risks, the role of supplier collaboration in risk management, and challenges in managing sustainability-related risks. Those comments were chosen for the thesis, which correspond to the topic to be studied comprehensively and are the most significant in terms of content.

3.5 Reliability and validity

Evaluating the reliability of the study is a key part of the research and it tells whether the study corresponds to reality or not. In general, a good way to evaluate the reliability of the study is to examine previous studies. When evaluating the reliability of the study, attention is paid on whether previous studies have achieved the same results. Scientific facts are not based on a single experiment, the research needs to be repeated several times under different conditions with different methods. In general, it can be said that the reliability of the study is good if a researcher is able to replicate an earlier research design and achieve same findings. (Saunders 2016, 202). The challenge of the reliability of a particular research is the small number of companies interviewed and therefore the results of the research cannot be generalized. Critics argue that this is one of the stumbling blocks of a Case study which has only a small number of cases. (Soy 1997) In addition, a free-flowing discussion during the interviews may pose a challenge if the conversation is too wide which may lead to a situation where the information is too fragmented. However, Eriksson and Kovalainen (2008) perceive that qualitative interviews may resemble normal, everyday conversation.

Validity refers to whether the study examined the problem, which it promised to investigate. There are several key elements which should be assessed when analysing the validity of the research. These include clearly written research question(s) to which appropriate answers are provided. The data is also collected, managed systematically and analyzed correctly. If these are included in the study

design, it will enhance overall study quality and trustworthiness. (Baxter & Jack 2008, 556) The reader of the study may evaluate the validity of the research by assessing how well the writing has answered the research questions.

4 EMPIRICAL RESULTS AND FINDINGS

Following chapter present the results of the empirical part of the study, beginning with a brief presentation of the Case companies. Later, the conclusion and analysis will sum up the findings.

4.1 Sustainability risks in supply chain

4.1.1. Product safety risk

Managing sustainability risks seek to manage a focal firm's exposure to sustainability risk sources, either in a proactive or a reactive fashion. Despite this, risk management can only be effective if one understands the types of risks that are present and affect the operations of the company in its operating environment. Case companies operating in a food industry identified product safety risks as one of the most significant sustainability risks in their operations. When it comes to food products, quality and safety are the most important characters of the product. For the case companies, product safety risk management is part of the company's sustainability work and they perceive a sustainable product is also safe for the consumers. In their operating environment, sustainability and product safety often go hand in hand. Majority of the Case companies distribute or sell a large number of different products to consumers or customer companies. Some products are so-called private label products or brands of other companies when the focal company resell them to consumers. When a company owns a brand, the responsibility for certifying quality and managing product safety risks is much greater, compared to a situation in which the company is reselling other companies' products. In the latter example, the focal company may not be involved in the product manufacturing process and thus cannot control the risks that arise during the production process.

Verifying the sustainability and managing risks of a single product requires collaboration between several supply chain actors, such as primary production from which the raw material is obtained and the manufacturer that processes the raw material and produces the final product. In addition, the distributor and warehouse

have their own important role in ensuring that the product is handled and stored properly so that it will not be damaged or spoiled. If there is an abnormal occurrence in the raw material content, it is of primary importance to know where the problem occurs in the chain. When it comes to food products, product safety risks include, for example, foreign objects in the raw materials or contamination risks, causing food spoilage. Contaminated food is usually harmful to health, which is a significant risk for both purchasing company and its customers consuming the product. There may also be an allergy risk when the product contains allergens that are dangerous to certain people.

Product safety risk can occur unintentionally. This may be, for example, a microbiological deviation in quality that is not detrimental to health. However, the deviation may affect the taste of the product being sold, which may require the company to issue product recall. If a foreign object in the raw material is not identified, the risk can be catastrophic, to both company reputation and individual consumer, as mentioned by the interviewee of a Case company A:

"Food safety is also part of sustainability. There are risks that occur from time to time, for example, a foreign object among a raw material. We have separated what kind of foreign object it is in the raw material. Issues like an insect in a lettuce and salad bags or bones in canned tuna happen time to time. Yes, tuna has bones and we can't fully avoid the issue even though we do our best. Then there is a high risk, for example, glass would be a disaster or even metal is a bad thing. These are the matters where we intervene".

(Case Company A)

Product safety risks may arise from independent causes, such as human error at the factory, whereby a foreign object cannot be detected. In general, however, the potential risks to product quality are known and companies have processes in place to deal with them. The quality management is responsible for the quality of the product and the warehouse is responsible for handling the product correctly. Case Company C strives to critically review policies and guidelines to properly handle products in stock. When products are handled by humans, the risk of human error is always present. However, the clearer and more understandable the instructions

for handling the products, the lower the risk that the products will become damaged during the warehouse process. When it comes to product safety risk, it actualizes as a risk when human health is potentially in danger due to failure of a supply chain process. However, the risk may materialize even if the product does not end up being used by the final consumer and even if the human life is not endangered. Such risk can occur if the product is handled improperly, causing food spoilage. The consequences are usually financial for the individual company. Case C interviewee mentions a defective product which is handled improperly in the warehouse. Due to the risk of contamination, the product cannot be sold to consumers and ends up being destroyed.

The company is held responsible for the quality of the product sold and its chain. If the product safety risk materializes and the product is consumed, the company might have to provide compensation for its customers. The situation might also put the company's reputation in question since it could not detect the danger early enough. Sustainability risk management is therefore a large-scale work that requires an understanding of the entire chain. An interviewee from Case company D reminds that the chemical structure of an organic matter changes all the time. Thus, it is impossible to eliminate the risks completely, but it is possible to minimize them. The most important matter is how effectively the focal company can take the necessary corrective measures even if risks cannot be completely avoided.

4.1.2 Economic risk

Economic risks are not the most common problems, based on empirical results. Case companies did not directly say that there were significant economic risks in their operating environment, but the risk of their existence is still recognized. Companies have measures to deal with economic risks, such as policies on corruption and bribery, as majority of them operate in countries that are vulnerable to corruption. One of the most important economic sustainability also concerns tax liability, i.e. the supplier must pay corporation tax to the state in its country of operation. It is important for companies to work with financially honest partners, because it is essential for business continuity and company reputation. Case company D interviewee said that they are cautious about suppliers operating below

marker price because it may be a sign of tax avoidance. This may also mean that the supplier in question will not be operational for a long period of time. Thereby, the supplier is only able to offer competitive prices in the short term. The partner operating at the lowest price may not be the most sustainable in a long term. By requiring the supplier to comply with the law and to follow the focal company's instructions and rules, it ensures that the supplier does not pose any risk to the company in the future, for example in terms of reputation.

"Russia has a bit of a reputation for being very risky when it comes to ethical issues. Customers can be assured that this kind of money laundering or bribery, which may occur there in the world, does not happen in our operation."

(Case Company G)

The most realistic economic risk that Case companies can face is counterfeit products, which is both a product quality and safety risk. Case companies operating a food industry refer to food frauds. Case company H interviewee describe food fraud as a deliberate act which may appear at some point in the supply chain of the product. By counterfeiting the origin or composition of the product, the supplier seeks to gain an economic advantage and unfair competitive position. Case Company G and D mentioned food fraud is not a typical problem in Finland, but it is a common challenge gaining recognition and concern elsewhere in the world. Food fraud can, at worst, be dangerous to human health, but an interviewee from Case company D said that the fraud could also be issue of an origin. In such case, the raw material comes from a different location that what label says.

4.1.3 Environmental risk

Many interviewees mentioned that the environmental impact of primary production has become a topic of debate in recent years, causing much controversy among consumers. Businesses are subject to a number of environmental requirements that, if neglected, would pose a potential risk to company operations and reputation. Similarly, companies also have the risk of consumers switching to a competitor that is perceived more responsive to environmental criteria and requirements. Thus, companies aim to reduce their carbon footprint and increase the circular economy

in their operations. Interviewees mentioned that as part of their corporate sustainability work, they pay attention to the sustainable and efficient use of natural resources, ensuring that the product is produced with the least possible environmental impact. However, when it comes to sustainability-related risks, they do not just include the product manufacturing process and its environmental impact.

The interviews highlighted the growing interest of consumers in the ecology of products and, above all, the debate on the environmental impact of packaging materials. In particular, the use of plastic as a packaging material has caused controversy. Plastic is considered by many consumers as one of the most important global problems that pollute the environment. Albeit, plastic has its advantages and it preserve the product better than some other materials, companies said they have been criticized for packaging their products in plastic, forcing them to think of other, more ecological packaging solutions and which create less waste. They have also focused on in increasing the recyclability of plastic. Greener packaging solutions have been developed in partnership with suppliers, and an interviewee of a Case company D said that with less plastic, the product is more sustainable. Not all interviewees agreed that sustainability of the product would be increased if the amount of plastic in packaging materials would be decreased. However, Case companies know that if customers see plastic as a problem, they should be able to respond or alternatively communicate with consumers to raise awareness of the pros of plastic. An interviewee of one of the Case company mentioned that recently the company was criticized by its plastic packages.

“This environmental sustainability focuses greatly on packaging materials, which is understandable, but in our area 90% of the environmental impact comes from the product itself. We always try to remind our customers that we always start with the goal of minimizing food waste, because it is much more important. [...] There has been a terrible debate in social media that now there is more plastic. People do not realize that the importance of plastic is small compared to the product itself if it is left unused.”

When talking about the environmental impact of the product, a few interviewees mentioned that the most significant environmental action is made during the

production phase, which creates most of the product's carbon footprint. The Case company B interviewee said that they pay attention to the use of water in cotton cultivation, as it is the most important resource used in the production of the raw material. The industry has been the target of public debate due to intense use of water and emissions caused by the production process. Excessive use of water can cause drought and erosion and thus impoverishes the surrounding nature. Moreover, pollutants and chemicals can end up in waterways and thus contaminate groundwater. At its worst, drought threatens both cotton farming and the life of surrounding communities if drinking water is not available. Another Case company interviewee also referred to certain food products that are at high risk due to intensive use of water in the farming. The interviewee emphasized that although there are no human rights violations in the supply chain, there may still be violations toward nature or violation of energy or water consumption. Thus, the risks are realized differently depending on the product.

Environmental risks are very much related to primary production, in other words, to the raw material manufacturing environment. However, risk management is not only the responsibility of an individual company. Legislation plays an important role in achieving environmental goals and reducing environmental risks. Legal requirements sets out, among other things, precise requirements for corporate waste management and the environmental impact of primary production. The raw material producers themselves are also well aware of the environmental impact of their operations, according to interviewee of Case company A. Operators in the sector have extensive knowledge of the environmental impacts and interest to manage them, but the risks still occur. Sustainability risks can sometimes emerge even closer than you think. Albeit, one of the Case company did not have a personal experience of environmental risk, the interviewee mentioned about an older case in Finland, where a supplier was fined for polluting the environment due to illegal landfill located in a forest. The event also affected waterways and fish farming negatively. The supplier was audited several times, but it took a while before the incident was discovered. At this stage, the case had already attracted media interest.

" No auditor can...how do you audit enormous forest? It is very hard in practice. "

The case demonstrated that environmental risks can occur even in surprising places and even if the company has policies to prevent and minimize risks, it is absolutely impossible to avoid them completely. When considering the event, the interviewees of the Case company C stated that the supplier would have never been considered as a high-risk supplier, as the company was in Finland. The supplier was also a small operator by its size, thus it was not probably perceived as a risky supplier. The case also shows that, despite the legal obligation to dispose of waste, there is always a risk that the supplier will break the law and thus expose the focal company to criticism.

The most significant environmental impacts of food products are generated during the manufacturing process. Interviewees refer to the product's carbon footprint, which is also a widely used concept in public discourse when it comes to product sustainability. An interviewee from Case Company C said that every food product has best before date that indicates the shelf life of the product. One of the many challenges facing businesses is reducing waste, especially food waste. When a product is spoiled or reaches the end of its shelf life, it cannot be sold to consumers. However, the product has an environmental impact, whether or not the product has been used by the final consumer. The interviewee said that the company does not seek to eliminate the waste, but to minimize it. The operation is characterized by the generation of waste that cannot be completely prevented even if the shelf life of the product could be improved.

"No matter how carefully you improve it, there will always be waste. The purpose is, of course, that we minimize the amount of waste. Whenever waste is generated, it is a bad thing in many ways. The carbon footprint is created when product is produced and when it is stored - something needs to be done about it. The root cause of waste generation is product surplus and product obsolescence. When the product reaches the end of its shelf life, there's nothing you can do. Together with sales, we strive to think about what we can do about it."

(Case company C)

When the company has capital tied up in stock, it also loses money when the product becomes damaged or obsolete. However, waste generation is first and foremost an environmental problem in which companies strive to find a solution. In this way, the environmental impact of operations is prevented or reduced, and the company can make savings through smarter and reduced use of materials.

4.1.4 Social risk

Case companies have a global business network, which means they have trading relationships with foreign dealers and distributors. Companies perceive that the risks are mostly in primary production, where the raw materials are processed before they are packed and shipped. The most typical primary production risks are social sustainability risks if the operator is located in so-called risk country. Risk countries are frequently characterized by relatively poor sustainability-related conditions. Interviewees mentioned that it is difficult to avoid risk country sourcing, due to availability challenges. Sometimes, it is simply not possible to purchase the product or raw material closer. Companies also have financial interest in exploiting risk country operators. Depending on the Case company, however, risk country sourcing plays at best only a small portion of the total sourcing volume.

The main raw materials of two Case companies come from Finland, but smaller raw material component, e.g. spices, come from risk countries. Although risk country purchase may represent only a small portion of the total purchase volume, the risk itself does not depend on the size of the volume. As an example, most of the company's purchases can come from domestic raw material supplier, in which case the company knows exactly where the production is located and who are the raw material producers. Here, raw material components, such as spices, will have a smaller role in terms of volume but the sustainability risk may still be higher especially if the raw materials are sourced from a geographically distant country, where workers' rights are not realized in the same way as for example in Finland.

Case companies are well aware of the countries in which problems typically occur. Moreover, companies know that there are social sustainability issues also occurring inside the Europe. However, the level of risk varies from country to country, due to

which countries are grouped into low-risk countries and risk countries. Case company B operate in a risk country outside Europe. Although extreme examples, such as child labor, have not occurred in the Case company's operations, the existence of risks is nevertheless recognized. In turn, Case company B and F both operate in so-called low-risk countries, which are nevertheless characterized with labour issues. There may be areas within low-risk countries where there are increased human rights risks. For example, in southern Europe there are increased human rights risks due to the use of cheap migrant labor in agriculture.

"Of course, there are these social risks in the supply chain, as well as human rights issues: child labor, forced labor, overtime hours, unfair wages. These are real risks and especially overtime and the wages are actual issues which are not even far away. But then again, child labor and forced labor are so extreme that they have not come up - at least in the audits."

(Case company B)

"We do assess where the biggest risks are. At the moment, however, we cannot think that, for example, human rights risks only occur outside of Europe. There are clearly risks in southern Europe and there are also risks in Finland. Yes, risks can be found. Usually those in Southern Europe are related to migrant workers' livelihoods. But we have not encountered a situation where it would be at risk, but they are still being assessed. The smaller risks often relate to, for example, overtime work, salary, or there is not enough fire extinguisher per square meter. These are usually the most critical measures."

(Case company F)

Sustainability risks can be further categorized to low and high risks based on their feasibility. Most companies do not utilize systematic risk management in their operations, but they still are aware of the sustainability risks associated with their own operating environment and know how to proceed with them. An interviewee at Case company C mentioned that the company does not spend time and resources to think about which risks are high and which are low. It relies on outsiders i.e. business information providers such as Down Jones, Reuters and Dun & Bradstreet which provide commercial data, analytics and insights for companies. From them,

the company buys information on country-specific risks, thus saving their own time and resources. The other interviewee mentioned that energy suppliers are vulnerable to corruption, but do not know why, because the information comes from an outsider.

Social sustainability issues concerns not only humans but also animals. One of Case company's sourcing work is mainly based on animal procurement thus the emphasis of the risk management is on animal welfare issues. Risk management is considered important by the company because a well-being animal is also productive. The company is involved in various research projects aimed at increasing and improving the welfare and health of animals. This is also important because the company is aware of the growing interest of stakeholders in animal welfare issues. The interviewee mentioned that animal welfare is really important in terms of risk as the topic is really emotive, which is why the company audits beef farms and slaughterhouses quite often. The risk management of the company is promoted by the fact that they have ownership of the primary production and thus receive accurate information on the animals. In addition, the company is well aware of the actors in the lower supply chain, i.e. the suppliers of the supplier. However, the industry is constantly struggling with financial challenges that directly affect sustainability-related risk management. If operations are not profitable, there is a greater risk that the sustainability perspective will not materialize. The interviewee said that financial issues have a direct impact on sustainability.

"If you think about animal welfare, for example, then there comes the question of how much space per animal, which means more investment - and what kind of animal enrichment. They can all be translated into euros."

With primary production under the control of the company, the materialization of risks has a direct negative impact on the company's reputation. When the risks have been detected, the company has had to terminate a number of contracts with the, particularly with regard to animal welfare issues. For the company, however, sustainability is a const balance between its own values and business needs. The Case company must weigh the continuity of its business and its profitability in relation to its own values and operating methods. Other companies also mentioned

that business must first and foremost be profitable and risk management cannot be done at its expense. The animal welfare issue is challenged if the business customer's demands for sustainability are less stringent than Case company's own. If the customer relationship is important and the operator is significant, it is possible that the company supplying its own products to the customer may have to conform to the customer's wishes and requirements, even if they differ from the Company's own requirements. Such situation may pose a potential reputational risk if animal welfare is significantly neglected. In this case too, the company has to weigh its own values and practices in relation to the client's own and to consider how important the relationship is to them and whether business can be done at the expense of well-being of animals.

4.2 Managing sustainability-related risks

4.2.1 Risk management through reputation management

Companies have multiple reasons to manage their sustainability-related risks. They have the desire to make their chains more sustainable, but by managing the risks, the company will also manage its reputation. The risk in the supply chain is also a risk to the company's reputation. Case companies were able to name sustainability risks existing in their operating environment, but not much was said about their impact on the focal company. However, one factor stood out which was the reputation of the company. The realization of a sustainability risk usually affects the company's reputation in some way and the bigger the risk, the greater the impact. The growing awareness of markets and consumers increased interest towards sustainable business practices has increased the interest to manage sustainability risks. The interviewee from a Case company A described Finnish consumers as "quite critical" when it comes to sustainability issues. Therefore, open dialogue and transparency with consumers are important in managing sustainability risks. From a risk management perspective, it is important to communicate not only achievement but also the sustainability challenges that the company faces in its operations. All the Case companies interviewed for the study produces an annual sustainability report in which they publicly discuss the different aspects and areas of sustainability. The report addresses, among other things, achievements in the

area of sustainability and what challenges the company still faces. In addition, companies have an open discussion with consumers on social media, such as Case company A.

“ Consumers sometimes ask really specific questions, they know a lot. We have opened a communication channel directly with consumers in various social media. There we have a discussion and talk about individual things that we have managed to improve. This debate is also about things that may not be as good as we would like them to be. Those issues are also openly discussed and reported.”

(Case company A)

Companies speak for transparency and want to communicate openly about their activities. On the other hand, this is also required by their stakeholders. As business environment become more transparent, it is even harder to hide potential problems from the public eye. If a human rights violation occurs in the chain, it is likely that it will become public sooner or later. Moreover, reputation risk is said to be one the most difficult risk to be managed. Therefore, reputation risk management is one of the underlying factors for managing sustainability risks. When talking about the effects of risk management, many interviewees mentioned company reputation, which is often at stake if the risks materialize. When a company is publicly criticized, the consequences can be financial loss, which at worst can paralyze the business operation. Some of the companies selected for the study have been critically scrutinized by the media which has exposed them to negative publicity. The more emotions the sustainability issue arouse in the audience and the more well known the company/brand is, the easier it is for the media to bring up the issue. The interviewee from Case company C argue that many scandals and news usually occur before the company itself gives a comment about it. Only a doubt of an issue can potentially create a backlash to a company. Case company H interviewee perceive the issue similarly.

“No matter what the risk is, they are all related to reputation risk. And, of course, the reputation risk has taken on a whole new dimension over the last five-ten years. Social media, and media in general, have become something - all sorts of views

and judgments are in the media, even if the background to the case is not known very well known. Then the reputation risk will happen, even if it's not really justified.”
(Case company H)

Sustainability-related risks are not always, however, caused by the focal company. The involvement of the company is assessed on a case-by-case basis, and if the risk was due to the supplier, the focal company may not be legally responsible for the event. Often, the focal company does not own any of its suppliers and is therefore not financially liable in the event of a supplier making a mistake. However, companies are aware that their reputation does not depend on this. Even if the sustainability risk is not directly caused by the focal company, it is held responsible for its suppliers' irresponsible behaviour. After all, it is the decision of the focal company with whom it collaborates and who upholds its values and principles. Thus, the company is as responsible as its supply chain. Companies also know that most often the suppliers are small players with no well-known brand. As the problem occurs, they often go unnoticed, as argued by one of the interviewees.

”If we're talking about animal welfare issues, the producer will always be responsible for that. However, it is our company logo which will be on the television if something goes wrong. It cannot be denied. I honestly have to say that the media loves when it is about a big company or a big brand.”

Consumers are not the only pressure on companies to act responsibly and ensure sustainability, but the pressure may also stem from business customers. If the sustainability risk occurs, the focal company might be obliged for its business customer for the event. There is a risk that the business relationship will end, which in turn will have a financial impact on the company. In addition, this at its worst can harm the company's credibility as an industry player which may affect future partnerships. One of the Case company mentioned that there have been human rights violations in their supply chain for which they are responsible for their client company. Sustainability risk management and reputation risk management go hand in hand, and both are realized due to each other.

4.2.2 Risk management through standards and audits

The most common way in which a company seeks to secure its supply chain sustainability is the use of the Code of Conduct, which allows the company to publicly disclose its sustainability principles. Moreover, CoC also sets basic principles for suppliers' sustainability performance. All case companies have sustainability policies/guidelines which are followed by their suppliers. It was mentioned that one task of the purchasing department is to commit suppliers to the company's Code of Conduct before starting the business relationship. It certifies that the supplier complies with and promotes international human rights and company's own sustainability principles. It may include rules about corruption and bribery and/or providing a safe working environment for employees, among other things. The Code of Conduct and other ethical principles were mentioned in all interviews as an important basic principle of CSR and risk management work. However, they do not in themselves guarantee that the supplier will act in a fully ethical manner, but in the supplier selection phase it will determine whether the supplier's principles are in line with the focal company. As expressed by the interviewee of a Case company C, when choosing the supplier, the focal company simultaneously chooses what kind of products the supplier produces, i.e. whether they are ethical or not. If the supplier did not accept the ethical principles of the focal company, then the products would not be sustainable either.

The Code of Conduct creates the framework for sustainable sourcing and is one of the cornerstones of contract negotiations with a new supplier. It creates so-called ethical principles for sourcing. In order to enter a contractual relationship with the focal company, the supplier must first approve and commit to Code of Conduct. In connection with the supply contracts, suppliers are required to sign a CoC of the purchasing company, which the supplier undertakes to abide by during the contractual relationship. By signing the CoC, the supplier usually also verifies to ensure that its (second tier) suppliers follow the focal company's sustainability principles. CoC is part of sustainable business practice, but also risk management which prevents problems in the supply chain. By using Code of Conduct, the company avoids cooperating with a supplier that exposes the company to sustainability risks in the future. However, many interviewees said that purchasing

only becomes sustainable through practical actions. Signature on paper alone is not yet a guarantee on anything.

“We have the policies which are really important. The purchase guideline would not work if it was only verbal or on a paper that no one reads. It needs to be taken to the practical level. It pretty much guides our operation and what we do. In our supplier contracts and all, sustainability plays a fairly large role. We have our own Code of Conduct, which must be added to every single supplier contract. In addition, of course, we are BSCI members and have the BSCI Code of Conduct and their terms of implementation. Suppliers must also follow them and act accordingly.”

(Case company F)

In addition to Code of Conduct, companies are members of corporate sustainability systems such as BSCI (Business Social Compliance Initiative) and utilize a social sustainability management tool such as SA8000 (Social Accountability). Both are based on international conventions established by the United Nations or the International Labor Organization (ILO). Certification is required by both consumers and business owners, and all companies interviewed have some kind of certification in place. Industry-specific certifications differ by the content, but as a fundamental principle, they all seek to ensure the sustainability of the supply chain and verify the safety of the product. Food business operators also use the BRC (British Retail Consortium), which according to Case companies is the most widely required certification in Europe for food businesses. Case company C interviewee mentioned that a BRC-certified (first-tire) supplier must verify that its own (second-tire) supplier operate under sustainability principles of the focal company. In this way, each supplier operating in the chain must require the same sustainability principles from its own subcontractors. Thus, sustainability-related risk management is the responsibility of the entire chain, not just the focal company. By using certificates, the focal company sets the boundary conditions for its suppliers, which it must adhere to in its operations. Many companies emphasized that certificates are often unconditional for new suppliers, but for old suppliers the contract will not be terminated if the supplier does not yet have a certificate. This is, for example, because the focal company has only recently begun to require

certification from its suppliers. In some cases, the Case company also knows its supplier personally and knows that a small family business may not be able to afford the certification.

One of the most important requirements of the Code of Conduct is that the focal company has the right to audit its supplier if it so wishes. The purpose of audits is to verify that the supplier is operating sustainably and in accordance with contracts. However, in a complex sourcing network with up to 100 or even 1000 suppliers, the focal company has no control over all of its suppliers. It is impossible to monitor the suppliers around the clock and verify whether the supplier follows the sustainability principles or not. This also poses a challenge to risk management. Therefore, in support of sustainable sourcing, the company or its third party performs audits to verify and clarify the supplier's compliance with the Company's Code of Conduct. From a risk management perspective, it is essential to evaluate the performance of suppliers, as this is the only way to know how committed suppliers are to comply with the principles of the focal company. By auditing the supplier, the focal company becomes aware of possible shortcomings in the supplier's operations, which enables the supplier to develop its own operations in order to continue or establish a business relationship with the company.

Companies also use evaluation tools to detect risks. Food-related risks are an actual threat, due to which Case companies operating in food industry assess food threats and food frauds. If the supplier produces so-called "high-risk product" that is susceptible to contamination and microbiological contaminants, such as yeast, the supplier will be audited more frequently. Moreover, companies may audit those suppliers more often, which operate in high-risk countries. Case company C also mentioned that if a supplier does not perform as agreed, for example, the company receive poor quality products, it might also trigger the cause for audit. Audits are designed to verify sustainability, but also to determine whether a supplier or a product manufactured by the supplier is as safe as it should be. Audits are utilized both old and new suppliers. Before entering a contractual relationship, audits serve as a proactive risk management approach to determine whether a supplier poses a risk to the focal company. Case F company said that they do not do any form of cooperation with high-risk country suppliers, unless the supplier is not audited by a

third party. This is particularly due to social sustainability risks which are avoided or at least minimized through audits.

4.2.3 Risk management through supplier collaboration

All Case companies have sustainability implemented closely as part of their strategy. An important part of implementation of sustainable sourcing is the commitment of suppliers to corporate sustainability practices, which simultaneously promote risk management. Supplier cooperation varies from company to company, but generally it is a collaborative discussion of, for example, problem areas and reflection on how to resolve issues such as sustainability risks. In Case company C, this is better known as supplier relationship management which aim for a deeper understanding of the supplier. Here, the commercial relationship is not solely based on transactions and tendering suppliers after the contract expires. The focal company aim for a longer-term partnership with the supplier to establish deeper partnership through face-to-face meetings and regular contact. An interviewee from Case Company A said that regular visits at the supplier facilities are not about supervising the operation, but are meant to increase the company's own understanding of how the chain works. Even if factory visits are not always meant to be audits, they promote risks identification when, for example, working conditions are seen in practice.

“ When we do factory visits, we don't go there as a police officer or some authority to check that that everything is how we want them to be. We go to see and learn, but also to bring new ideas. Me and my colleague (second interviewee) have visited many different factories [...] There is one thing which I have talked a lot, especially when I have visited factories in Asia. There are many people working at the factories, compared to Finland. They stand for most of the day. I've talked a lot about carpets, which greatly affect the well-being of your back, that is, are you standing on a hard or slightly softer surface. Many of these have been developed and used in food product factories in Finland. These kinds of things are often brought there, that is, new tips on how they could do better.”

(Case company A)

Majority of the interviewees agreed that supplier cooperation plays a significant role in managing sustainability-related risks. When practicing sustainable sourcing, many interviewees said that long-term supplier relationships are essential without which it would be difficult to manage sustainability-related risks. Long supplier relationships positively contribute to sustainability work and risk management. Both focal company and its supplier most likely have the desire to understand and to address the perceived risks in the chain, because those can pose a threat to the continuity of business relationship. Long-term business relationships and cooperation is the key when managing sustainability risks, acknowledged also by an interviewee from a Case company D, F and H.

“Then we come to this interesting topic. Long term relationship. If we had a short time relationship, a month-long contract with someone who provides certain specifications at the lowest price. In such case, a discussion of improvement or longer-term development is not possible, because we do not know who (supplier) we have after six or three months. The development and collaboration, that's not the case because you have the interest of transaction, not a long-term business relationship.”

(Case company D)

“Cooperation plays a key role in risk management. If there was no cooperation, we would not be able to map the entire production chain.”

(Case company F)

“ When it comes to risk management, it is at great importance - we favor long-term supplier relationships.” (Case company H)

Collaboration facilitates the smooth flow of information through the chain and thus enables fast reaction if the risk occurs. Albeit companies may in some cases have the opportunity to switch suppliers, they still cherish long-term cooperation with so-called strategic suppliers because it is seen as a positive contributor to sustainability work and risk management. When discussing the length of supplier relationships, many interviewees said that the company has both short-term suppliers and strategic suppliers with whom a long-term business relationship is built. The length

of contractual relationships varies depending on the supplier, but the longest relationship lasts over ten years.

4.3 Barriers of sustainability-related risk management

4.3.1 Complex supply chains

To be able to improve risk management of sustainability-related risks, it is important for a company to understand what is hindering successful risk management. When it comes to global supply chains, managing sustainability-related risks is often a challenging task. As the chains expand, the more difficult it is to control the sustainability risks emerging from the supply base. Case company B's interviewee says that because their products are outsourced, the focus of the sustainability work is also in the lower part of the chain. The likelihood of risk materialization is higher if production is outsourced to high-risk countries. This is particularly true if the chain is complex, as the companies are not in a position to control and monitor all of their suppliers with scarce resources. Thus, the challenge is to ensure the supplier actually commit to sustainability in its daily work. The interviewee from Company D mentioned the challenge of controlling working conditions of the supplier. Case company D perceive that risks can be minimized by using certified suppliers who ensure that they adhere to and respect ethical principles defined at national level, such as labor and social rights, but that too is not a sufficient guarantee on anything.

"The challenge is the working conditions of certain countries, which are the most difficult to control. South Africa, for example: even if we get all the certificates and all that, we still can't really know how the farmer treats its workers. Maybe this is the most... even though they have insurance and everything else, but still." (Case company D)

Similarly, the more components needed to make a product, the more likely the chain is complex. Some of the components used in the product may come from the other side of the globe, which may prevent the company from auditing the supplier due to its remote location. The closer the production is, the easier it is to identify and thus manage sustainability-related risks. It is more likely that the manufacturer (the

supplier) is known personally and its operating methods, if it is geographically close to the focal company. Similarly, if the chain involves multiple intermediaries, such as importers and wholesalers, the chain gets more complex. Case company F interviewee perceives that complex supply chains make it difficult to trace the origin of the raw materials.

“When the raw materials come from a trader who in turn buys from an agent who in turn purchase them from ten different farms. That’s where the problem is [...] That's where the risk grows if the chain is more complex... that’s pretty clear. The risk increases as we go five or six tires backwards. Being able to verify every single raw material used in the product. I believe that no company has succeeded in it 100% and certainly cannot.

(Case company F)

Operating in a global supply chain, companies may not have enough resources nor strategic intent to track down the entire chain by themselves. Most often focal companies do not have any other option than assign their suppliers, i.e. tire-one supplier to verify tire-two suppliers’ sustainability. In addition, companies use third-party auditors who can verify the sustainability performance of the supplier. The focal company itself, with its own staff, is often unable to do such an extensive job with its hundreds of suppliers. Therefore, it is most viable to focus resources on those products or raw materials that play the most significant role in the company's turnover in terms of purchasing volume. However, the interviewee from Company C notes that risk does not, however, look at the size of the volume.

“Purchase activities are traditionally more focused on spend and we focus our activities on big spend. However, in terms of risks we should have the entire palette. If we only focus on big spend, we don't know the little ones (suppliers), we don't go visit them. If we have a wholesaler, we will not visit their supplier. That's why we use wholesalers, so we don't have to go. Thus, the smallest ones bear the greatest responsibility.

(Case company C)

In a complex supply chain with its hundreds of suppliers, the focal company may not know the manufacturer or the raw material producer personally and its operating environment and methods. By outsourcing the purchase process, the focal company must rely that the merchant verifies the sustainability performance of the raw material producer. However, outsourcing can create long supply chains, which makes it difficult to trace the origin of the raw materials, for example. Case Company B's interviewee states that certification is the only way to 100 per cent verify the origin of the raw material. The company has begun investigation which provide country-specific information on the origin of the raw material. When it comes to non-certified raw materials, the focal company can never be entirely sure about the origin of the raw material.

"But it's a fact that the origin - if it's not certified, then they can never know exactly where it comes from since there are those wholesalers and others all over the world [...] The information is available if it's certified, but otherwise it's more like, '*Well, they usually buy it from this and this country*'. And then they mix the raw materials". (Case company B)

4.3.2 The difficulty to influence on supplier's behaviour

Managing sustainability risks is a complex process that companies implement differently depending on their industry and the nature of their operations. To make their chain more sustainable and thus influence the generation mechanism of risks, it is essential for the focal company to have influence over its supplier. Case companies perceive that the more a company's acquisitions weigh on a supplier's turnover, the greater the influence over the supplier's sustainability behaviour. If the supplier fails to comply with the sustainability requirements of the focal company, there is a risk that the company will acquire elsewhere. Many interviewees perceive that the size of the purchasing volume is of great importance in the realization of sustainability. Similarly, the smaller the volume of the procurement, the more challenging it is to introduce the purchasing firm's sustainability practices for the supplier company.

“Of course, we have an impact on a company, the majority of whose revenue comes from us. For a big house, we mean nothing in low-volume products and in some high-volume products for a small house we really mean a lot. Everything else settles in between, i.e. how big our volume is and what that volume means to that supplier.”
(Case company A)

Case company A says that they have a large number of domestic suppliers for whom company's purchase volumes are important for their turnover. The size of the purchase also helps that when the focal company has suggestions for corrections based on the findings made during their, for example, factory visits. Suppliers are more willing to listen if the purchasing volume of the focal company is significant to the supplier. However, the interviewees state that volume is not always everything. They also have a global supplier for whom their purchases are financially meaningless, but long-term cooperation creates the basis for risk management. Despite this, many of the interviewees say that global, multinational supplier are most challenging to influence and correct their operations. One of the interviewees said that when it comes to a global supplier, with 2% of its production being sold to the company, it is difficult to demand sustainability requirements. The situation gets more difficult if the requirement of the focal company is an extra cost to the supplier. The supplier may be tempted to not follow sustainability requirements and avoid risk management if it creates an extra cost to the business.

“Our purchase can be 2% of their full-year production, so it is quite challenging to start demand anything. Or, of course, we can require, but it is more challenging if no other customer is demanding the same thing ... especially if it is a cost to them, it is challenging. [...] Sustainability, of course, connects people, but It's a bit childish to think that sending a sustainability person to a supplier who doesn't sit on a pile of money would affect something. However, if the product manager who sits on a pile of money tells about sustainability at the same time, that effect is much bigger. Then the supplier is afraid that if they do not follow certain sustainability issues and policies then the purchase may end.”

The focal company can never be 100 per cent sure whether to supplier complies with the sustainability requirements or not, but the benefits of volume help to set

the standards of sustainability. In addition to the size of the volume, the nature of the relationship between the focal company and the supplier define whether the focal company can influence on its supplier's behaviour. A company is best able to influence straightforward, i.e. chains with only a few partners. Similarly, the company has the greatest influence over its own suppliers, but the impact on the lower supply chain can be challenging. Case companies find that it is easier to influence on their own suppliers with which they have direct relationship. In an ideal situation, the supply chain is short involving only a few partners, which also enables smooth information flow between partners which in turn promotes risk management. It is easier to create a connection in conversation when trading directly without middlemen. Companies engage in collaboration with their own suppliers rather than subcontractors.

Ability to minimize and eliminate sustainability risk depends largely on where in the chain the risk occurs and what is the company's relationship with supply chain partners and what is the size of the volume. If the company does not have a direct business relationship with the supply chain partner, it may not be able to handle the risks, such as, social sustainability risks. From the risk management perspective, the ideal would be to acquire without any intermediaries, which promotes dialogue and willingness to negotiate between the parties. Moreover, the more control the company has over the chain, the easier it is to manage sustainability risks. Purchasing volumes of the focal company may play a small role in the supplier's turnover, but many interviewees felt the pressure within the industry was a contributing factor in the promotion of sustainability. When sustainability practices become the norm and other companies take sustainability risk management on their agenda, it is profitable for the supplier to comply. If an individual supplier neglects the sustainability requirements, the continuity of its business will be at risk if its competitors are able to meet the sustainability requirements.

4.3.3 Information reliability challenges

Successful risk management is further complicated by information reliability challenges. The problem is related to the aforementioned risk management challenge, i.e. the complex supply chain. The more parties involved in the chain,

the more challenging the seamless flow of information, for example regarding of the origin of the raw material. As information passes through multiple middlemen, it is possible that it is not up-to-date and accurate once it reaches the focal company. An interviewee of Case company G mentioned that if they want information on the origin of the raw material, they will know the country of origin. However, as supply chains change all the time, the country of origin of the raw material may change, as a result, the company may not have reliable and up-to-date information. The focal company may not know whether the raw material comes from a country associated with, for example, social sustainability risks. Companies, therefore, sometimes rely on the supplier's word and can only hope that the information given to them is accurate and reliable.

"Often for commercial reasons, suppliers tell you certain things, but not everything. To get all the information we want, we also have our own specifications. The country of origin is one of them and suppliers usually tell it, but in a constantly changing world, of course, this is a bit tricky. In a capitalist system, supplier sourcing department does its own job and changes suppliers, thus the country of origin may change. Sometimes they write that the country of origin is one of the 4-5 countries. There are also such cases and we have to separately ask what it is at the moment. We ask them to keep us up to date on whether it has changed. If the origin is now Lithuania, for example, and if it changes to Poland, please let me know."

(Case company G)

Raw material supply chains are constantly changing in the global supply chain. Like the focal company, their suppliers also request for tender. Every time the supplier changes, there is a possibility that the origin of the raw material changes. Thus, information is constantly changing. Sometimes, however, the raw material supply chain changes by force of circumstances. This may be due to bad harvest. For a product to be manufactured, the supplier must be able to source the raw material from where it can. A poor potato harvest in Finland may force the supplier to source potatoes from Baltic countries. As the origin of the raw material may change for independent reasons, companies require in their procurement contracts that the supplier must inform them if the origin changes.

Case company F also uses the obligation principle in its contracts. Under various agreements, they oblige their suppliers to inform them if the origin of the raw material changes, but in practice, the supplier will inform if it wants to. With over a hundred suppliers, the company F has no choice but to rely on its supplier's word and the information it has provided. The focal company cannot ask each of its supplier whether things are as they are said to be. In some cases, the supplier deliberately does not tell the origin of the raw material, citing trade secrets. In this case, the information is not disclosed in order to secure the competitive position.

Many Case companies mentioned that until a few years ago many suppliers were reluctant to tell the origin of the raw material, but nowadays suppliers know that information needs to be disclosed. An interviewee from a Case company said that 10 years ago, some of the suppliers they were using refused to disclose the origin of the raw material, citing trade secrets. The company has a desire to tell its customers the origin of the products and where the raw materials are purchased, because they feel there is nothing to hide. However, they still have work to do in this area, albeit it is much easier to get the information from their suppliers compared to 10 years ago. The trade secret aspect also concerns the information regarding of the business partners. Case company G's interviewee mentioned that their suppliers are really reluctant to tell the names of their suppliers, in other words, the second tier suppliers by citing trade secrets. To ensure sustainable supply chain, the focal company must know the different parties involved in the chain so that it can react to problems when needed and know the source of the risk. If a supplier is reluctant to disclose the contact details and names of its own suppliers, the focal company is in practice unable to know under what circumstances its products are manufactured and by whom.

Obtaining reliable and up-to-date information is a challenge where the focal company cannot do anything than rely on its supplier's word. The company also has to rely on the supplier's on issues like certificates. In the previous example, Case company B mentioned that certification is the only way to verify the origin of the raw material, but another company was cautious about the issue, especially in food industry. There is always the possibility that a supplier is lying and the

information they provide turns out to be false. This can become a risk to the company if, for example, the product claimed to be organic is not organic.

" In principle, the certificates of our suppliers are okay, but the certification itself may never guarantee anything. [...] Of course, we have to believe in the certificates that are given to us until proven otherwise."

5 CONCLUSIONS

The final part of the study summarizes the findings of the empirical part and reflects them to the theoretical part of the study. By combining the results of the theory and empirical part, main research question and its sub-questions are answered. The results of the empirical part are also summarized in Table 7-9. Lastly, the limitation and suggestions for the future research are given.

5.1 Answers to the research questions

How do companies manage sustainability-related risks?

The main objective of the study was to explore sustainability-related risk management of the companies. The theory suggest that risk management is seen as a prerequisite for business success and a company that is unable to manage the risks arising from its operating environment is doomed to fail sooner or later (Rostamzadeh et al. 2018). To implement successful risk management, it is necessary to identify the risks arising from the operating environment so that the risk can be managed. In this respect, sustainability-related risk management does not differ significantly from managing typical supply chain risks, such as forecast errors or delays. Whatever the risk, successful risk management is systematic, beginning with the identification of risks and ending with monitoring and controlling risks.

The theoretical part of the study also suggest that risk can be categorized into map based on its significance to the business and probability of occurrence, as presented by Norrman and Jansson (2004) in their study. However, Case companies did not mention that they use of systematic risk mapping as part of sustainability-related risk management, although there are specific measures for each sustainability-related risk. Neither did Case companies say they would assess the probability of the risk. The impact of a risk on a company's operations is usually difficult to predict in advance because the sustainability-related risk arises through stakeholder reaction. As a comparison, delivery difficulties are financially measurable, and the materialization of the risk can be mirrored by the past

experience with the supplier, for example. However, the theory also suggested that the focus of risk management should not be solely on financial consequences, but also on the impact of reputation, status and credibility. Empirical results showed that companies are aware of the impact of risk on reputation and that the more emotions the risk arouse in the audience, the greater the impact of risk on the reputation of the company. Thus, sustainability-related risk management is usually guided by reputation management.

Hofmann et al. (2014) stressed out in that the goal of risk management is also to transfer risks which empirical results show that companies carry out this by sharing responsibility of the risk management with other actors in the chain. Risk management is carried out in cooperation with suppliers, thus the risk management is not only the responsibility of the focal company. Through various supply contracts, the company obliges its suppliers to monitor and ensure the sustainability of its own supply chains. Sharing of responsibilities is resource-wise, but also a convenient way to manage risks. Risks are easier to manage when a business partner's practices are known, and this is facilitated by a direct relationship with the supplier. In a complex purchasing network, the focal company cannot personally know all the parties involved. As Harland et al. (2003) stated, not all risks can be avoided, but they can be managed, and this is best done by rational allocation of resources. Table 7 describes in more detail how companies manage their sustainability-related risks.

Table 7. Case company risk management

Reputation management
Open dialogue and transparency with consumers
Sustainability report
Standards and audits
Develop and apply sustainability policies (CoC)
Avoid cooperation with unethical suppliers
Monitor suppliers through audits
Supplier collaboration
Work closely with suppliers
Engage suppliers to manage risks

The empirical part of the study indicates, that companies' risk management is driven by the avoidance of reputation risks. Businesses want to act responsibly, as this is the right way to do business, but they also want to avoid adverse reactions from stakeholders that could damage their reputation. This is especially important when production is not in the company's hands and in a global operating environment, risks usually stem from the company's supplier base. Because of this, companies are particularly focusing on the supplier perspective in their risk management. The findings of theoretical part suggest that sustainability-related risk management should be linked to supplier management processes, which are supplier selection, evaluation and supplier development. (Foerstl et al. 2010, 119). Empirical results show that companies do this by utilizing ethical guidelines/sustainability policies in their supplier selection process, through which they determine the level of sustainability of their suppliers and avoid collaborating with unethical suppliers. Teuscher et al. (2006) perceive this as a supporting factor of a risk management. However, the companies are aware that the suppliers may not be committed to the sustainability requirement, and they feel that a signature on a paper is not enough to guarantee sustainability. They perceive that actions speak louder than words. Companies audit their suppliers either by themselves or utilizing third-party to verify sustainability level of the supplier and whether it is consistent with the focal company's requirements.

What sustainability-related risks exist in supply chains?

The second research question aimed to find out what sustainability-related risks exist in the operating environment of the companies. Based on the theory, sustainability-related risks can be categorized into environmental, social and economic risks. Suggested by Giannakis and Papadopoulos (2016), risk management measures depend on the sustainability-related risk. Each risk can also be divided into exogenous and endogenous risks, depending on whether the sustainability-related risks are caused by the company's activities or the company's interaction with the external environment. However, the empirical results showed that Case companies mainly manage the risks posed by the company's operations. Interestingly, results show that companies had to mention risk management

measures for risks that do not occur in their operating environment, but their potential existence is acknowledged. Thus, risk management measures are being implemented proactively. Such risks include, for example, policies related to corruption/bribery and tax evasion which are better known as economic risks. Sustainability-related risks are in more detail in Table 8.

Table 8. Case company sustainability-related risks

Social sustainability
Labour issues (unfair wages, overtime hours, migrant worker's rights)
Child labour/forced labour
Unethical treatment of animals
Environmental sustainability
Packaging (Excessive packaging, unsustainable materials)
Excessive product waste (food waste)
Pollution (pollutants and chemicals in the production)
Unsustainable use of natural resources (excessive use of water)
Violation of environmental laws
Economic sustainability
False claims (origin of the product or raw material)
Bribery/corruption
Tax avoidance
Product safety
Quality issues (microbiological deviation, food spoilage)
Contamination risk (defective product, allergen risk)
Food safety (foreign object)

The empirical results of the study are in line with the theory regarding sustainability-related risks. The risks listed by Giannakis and Popodopoulos (2016) are similar to risks with which the Case companies struggle in their daily work. The only difference was the risks related to product safety, which companies also felt strongly related to sustainability. Thus, the concept of sustainability-related risk covers not only environmental, social and economic aspects but also product safety. As Kim et al. (2019) stated that product safety / quality problems can also trigger adverse reactions from stakeholders which are caused by ethical / moral misconduct of the supplier. Hence, sustainability-related risks should be divided into process and

product related risks, which clarifies whether the risk is related to the product (contamination risks, microbiological problem etc.) or its manufacturing process (child labor, energy consumption etc.).

Most typical supply chain sustainability-related risks are social sustainability issues such as unfair and inequitable treatment of workers. Environmental risks, in turn, were related to cultivation (pollution and excessive use of natural resources) and end of product life cycle (food waste). The results show that companies spoke very cautiously about the financial consequences of the risks and the most typical impact of a risk is on the company's reputation, but it was unclear whether the negative reputation has had a significant impact on the company's finances. Anecdotal evidence (Hoffman et al. 2014) suggest that the realization of the sustainability-related risk may result in loss of financial position and decreased sales, but it is unclear how extreme the sustainability-related risk must be for this to happen. There is no correct answer, but based on the empirical results, the financial impact depends mainly on two factors: how well-known the company/brand is and how sensitive the topic (risk) is.

What challenges are associated with sustainability-related risk management?

Implementing a sustainable supply chain and managing risks are complicated by a number of factors and problems are most common in global, long supply chains. Previous studies refer to problem areas that are specifically related to problems in the lower level of chain, such as non-compliance with sustainability requirements and unsustainable elements of the operation. If the company does not know the lower-tier suppliers, it will not be able to ascertain whether the supplier complies with the requirements and how the company operates. Theory suggest that this will hinder the risk identification (Beske et al. 2008). In practice, the more extensive the product portfolio the company has and the more intermediaries it has in its chain, the more difficult it is to manage sustainability-related risks. Empiric results show that companies are well aware of the challenges involved in implementing risk management, and even if the purpose is not to eliminate all sustainability-related risks, managing them all is really challenging. This is particularly true with the ever-changing requirements of sustainability and changes in the supply chain. Risk

management requires companies to be responsive and aware of their supply chain and to have previous experience. Risks can only be managed if they are known.

Influencing supplier's sustainability work is easiest when the relationship is based on long-term cooperation and managing sustainability risk is not an extra cost to the supplier. Empirical results show that the monetary value of the purchases to the supplier's turnover is also an enabler but also a challenge from a risk management perspective. In addition, companies also face challenges related to the reliability of the information they receive, such as the origin of the raw material. Information may also be withheld from them for competitive reasons. In practice, however, the purchasing company can never be certain that the supplier will comply with the sustainability requirements unless otherwise proven. Thus, the focal company can only trust its suppliers' word.

What is the role of supplier cooperation in risk management?

The role of collaboration in risk management is at great importance for the focal company, supported by previous research and empirical results. Collaboration is particularly important in a global operating environment where companies are increasingly dependent on their suppliers (Foerstl et al. 2010) and cooperation seeks to remedy the anomaly in the supply chain (Grimm et al. 2016). The empirical results show that cooperation is perceived as an important factor of risk management, but it is often achieved with those whom the relationship is long. The relationship is often manifested in discussions and a desire to better understand the supplier's operations. As a by-product of collaboration, a successful risk management is created. Cooperation usually creates trust and understanding when it is easier to address problem areas (risks). In a collaborative business relationship, both parties have a greater interest in finding common ground in resolving risks compared to a situation where suppliers are competed on a monthly basis. For the sake of business continuity, the supplier is usually willing to solve problems. Also, by knowing the supplier's personally and their policies, the company will also become more aware of potential issues. This is also supported by theory, e.g. Li et al. (2016) research.

It is possible, however, that the word “cooperation” was understood differently depending on the company. For some, it is about making a trade when for another it is a deeper knowledge of a supplier which is known as “supplier relationship management”. Nonetheless, the cooperation was understood to support the exchange of information between the parties and the identification of risks, for example, when visiting a supplier’s factory. As part of cooperation, the interviewees emphasized the pursuit of consensus and the promotion of business continuity. In the case of flagrant violations, such as neglect of animal welfare, contractual relationships have been terminated. In principle, however, problems are being resolved by consensus, especially if the supplier relationship is seen as important for business. When there is a room for correction, the supplier will be given the opportunity to correct its mistakes. Changing suppliers on a regular basis would make it more difficult for the company to further its own sustainability objectives and thus to promote the chain's sustainability performance. Although some form of cooperation is pursued with all suppliers, it is only through long-term supplier relationships that effective risk management and sustainability objectives can be promoted. Companies perceive collaboration with their suppliers as an important part of risk management and as a contributor to sustainability. Previous findings also show that supplier collaboration is a critical factor in creating a sustainable supply chain and managing sustainability-related risks (Li et al. 2016, Teuscher et al. 2006, Touboulic and Walker 2015).

5.2 Limitations and suggestions for future research

The research method of the study has certain limitations. The empirical data is collected by interviewing a limited number of companies, which in turn affect the generalizability of the results. However, the purpose of the Case study is not to generalize, but to provide an overview of the phenomenon. Therefore, it would be interesting to cover the research topic with a larger sample and to interview companies of different sizes from different industries, since half of the companies interviewed for the research are food business operators. As stated earlier, the financial impact of sustainability-related risks is difficult to predict, so a potential topic for further study would be to measure the effects of sustainability-related risks.

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