Risk Assessment and Mitigation Strategies

Suppliers and Retailers in the Swedish Organic Food Market

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Abstract

Background: Consumer interest and demand for healthy and ecologically produced local food has led to a high market demand that local production cannot meet. Product attributes of perishability and short life cycles ensure that even local supply chains are challenging to manage. This increases potential for risks occurrence in an Organic Food Supply Chain (OFSC) especially with unreliable supply of products. Small and established food retailers import organic food products from across the world. Custom delays, high transport charges, commodity costs and regulatory requirements are associated with food imports. This renders OFSCs complex and vulnerable to disruptions or breakdowns that require appropriate strategies to identify and mitigate risks.

Purpose: To gain an overall insight of risks mitigation in OFSCs. The purpose of this thesis is to assess risks affecting suppliers and retailers of organic food and propose risk mitigation strategies to prevent or minimise supply chain breakdowns.

Method: This qualitative study utilizes a case study strategy involving seven case firms and seven research respondents. Data is collected through semi-structured interviews and documentary secondary data. The analysis of the empirical findings is conducted by cross analysing empirical findings of respective case firms and then emerging patterns are formulated into a general framework.

Conclusions: Low conversion rates of farms for organic production, high costs of investments and regulatory requirements have contributed to prevailing production risks that partly cause low organic output. Other risks identified that could disrupt the food chain under study include sourcing, warehousing, demand, price, financial and institutional risks. Mitigation strategies proposed include production procedures, CAP, supply chain flexibility, supply chain visibility, certification, diversification of retail channels, brand image building, horizontal & vertical cooperation and buyer-supplier relations.
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List of Abbreviations

BCP: Business Continuity Planning
CAP: Common Agricultural Policy
EU: European Union
FIBL: Research Institute of Organic Agriculture (Forschungsinstitut für biologischen Landbau)
GMO: Genetically Modified Organisms
OF: Organic Food
OFM: Organic Food Market
OFSC(s): Organic Food Supply Chain(s)
SCM: Supply Chain Management
SCRM: Supply Chain Risk Management
1. Introduction

This chapter introduces the study’s background, problem discussion, purpose and delimitations. The role of supply chain management and emergence of risks in business networks are discussed. Risk factors within the organic food (OF) market in Sweden are explored. This review aids formulation of the problem statement that leads to development of the research questions to fulfil the purpose of the study. Delimitations clarify the focus of this thesis and finally, key concepts integral to the study are defined for better understanding.

1.1. Background

Consumers’ interest in healthy food has not only changed the organic food (OF) industry, but it has also provided access to new markets (Cognizant, 2014). What began as a niche market with a small consumer base, served by a limited number of retailers, has developed into a preferred choice of quality-conscious consumers (Zsidisin, Melnyk, & Ragatz, 2005). Greene (2013) attributes increased demand for OF to health concerns, desire to enhance environmental protection, attractive product prices, and social and ethical factors such as animal welfare. However, Cognizant (2014) reports unique challenges in organic food supply chains (OFSCs) related to cost and logistics of transporting organic products to the market. OFSCs are vulnerable to risks that can affect business growth, reduce profit returns and increase inventory management costs (Fearne, Hornibrook, & Dedman, 2001). Uncertainty arises from many processes and actors involved such as suppliers, service providers and consumers (Dani & Deep, 2010). For consumers, trust is a key decisive factor on whether to buy OF and is hugely influenced by food origin, price and certification processes (Maurizio, Erika, & Roberta, 2006).

As the organic food market (OFM) continues to register increased growth, firms must invent cost-effective strategies of delivering products to consumers (Peck, 2006a). This requires ensuring food quality and integrity at every level of a supply chain (Kleindorfer & Saad, 2005). According to Manning and Soon (2013), traceability becomes increasingly critical to ensure product quality along the supply chain. The preservation of product quality from the source to the final consumer is vital in maintaining its value (FAO, 2013). This requires specialised transportation and logistics resources (Mainetti et al., 2013) to handle, pack, and distribute products (Manning & Soon, 2013). The Chinese milk incident that left thousands ill after consuming melamine-tainted milk powder illustrates consequences of neglecting traceability in a supply chain (Deep & Dani, 2009). Chopra and Sodhi (2014) state that risks require firms to incorporate resilience in operations to achieve optimal performance. Christopher and Peck (2004) describe resilience as “the ability of a system to return to its original state or move to a new, more desirable state after being disturbed.” Recurrent risks such as demand fluctuations require business firms to focus on efficiency to improve matching of supply and demand. Chopra and Sodhi (2014) argue that disruptive risks tend to have a domino effect on the supply chain where an impact in one area affects the entire network.
Swedish food market

According to the Research Institute of Organic Agriculture (FIBL), (2008), the development of organic agriculture is a worldwide phenomenon. It represents one percent of the total agricultural surface but this percentage is expected to grow. Sweden was the ninth biggest organic food market in 2014, accounting for 1.4 billion Euros in sales (IFOAM, 2014a). It also has the 16th biggest organic farmland with 501,831 hectares (2014) which represents 16.4% of its farmland, the second highest percentage worldwide (FIBL, 2016). These statistics show that Sweden is a viable choice to study OFSCs. Sweden has among the highest consumption of OF in Europe (Ekoweb, 2015). Public institutions (Schools, hospitals, and hotels) are among major drivers of development of the organic retail market (IFOAM EU Group, 2012). Retail chains ICA, Coop, Axfood and Bergendahls (Krav, 2015) dominate the Swedish food retail market, offering both retail and wholesale distribution of food and beverages (Chamber Trade Sweden, 2013). There are small and medium sized discount retailers also offering customers products not readily available and sold in big retail stores (KRAV, 2014).

Insufficient local supplies have prompted firms to rely on imports to cover for local production shortfalls (Brat, 2015). These imports account for about 50% of organic sales in Sweden (Ekoweb, 2015). Unreliable supplies of OF is a major challenge local firms face and is a potential source of supply risks (Ranninger, 2014). This background provides a platform on which the problem discussion on OFSCs was formulated with a focus on supply and retail level where key themes on risks were investigated.

1.2. Problem discussion

Swedish consumers are increasingly demanding ecological and locally produced food (Ernst & Young, 2015). However, the market demand for OF is outstripping local production yet converting to organic production is costly and time consuming (Faber, 2006). During the transition period, new farming processes have to be mastered meaning no production is done (Henchnon, O’Reilly, & Cown, 2002). Organic farming is capital-intensive requiring sustained investments in equipment and processes before any yields are reaped (Krav, 2015). Because of unreliable supply, OFSCs are vulnerable to supply and demand risks that affect firms from the upstream right up to the downstream (Oberholtzer, Dimitri, & Jaenicke, 2014). Firms work to ensure sustainable, ethical food production, distribution and consumption where trust and values are appreciated (Milestad et al., 2010; Bjorklund et al., 2009; King 2008).

The factors mentioned above contribute to low OF production resulting in limited availability and increased prices of organic products (FIBL & IFOAM, 2016). This also causes challenges in aligning supply and demand, which may increase operation costs and ineffective promotions for firms concerned (Hamm and Gronefeld, 2004). In addition, OFSCs like any other supply chain may have collaboration challenges with members having different values and motivations in the network (Jones et al., 2001). With gaps between supply and demand, logistics failures are inevitable which set in motion other events that can disturb an entire supply chain network (Stolze, Zanoli, & Meredith, 2016). These factors increase potential of instabilities in structures and performance of OFSCs necessitating solutions to secure networks (Buddress, 2014). According to Willer et al., (2016) OFSCs need to adapt rapidly to changing consumer
preferences and to an increasingly complex and global business environment. Enhanced traceability and assurance mechanisms are vital to keep pace with such increasing global complexity (Cognizant, 2014). Stolze et al., (2016) advocate for shorter supply chains essential that promote integrity within OFSC while developing and sustaining consumer trust.

Organic certification provides consumers assurance of the authenticity of organic products (KRAV, 2015). However, certification takes a long time to be completed contributing to low organic production (KRAV, 2014). Firms face enormous challenges in finding alternative sources of supply since local producers cannot guarantee adequate supplies (Ekoweb, 2016). Firms have resorted to importing OF to boost product availability but this has added costs and risks (Ranninger, 2014). Product damages, contaminations or increased lead-times can arise from custom delays or supplier failures causing financial losses (Deloitte, 2013). OF imports cannot guarantee product quality (freshness), safety and a reduction in emissions during transportation (Beulens et al., 2005). These factors coupled with the interdependencies between various stakeholders in an OFSC make collaboration necessary but very challenging (Naspetti et al., 2011). With a high percentage of food imports in the Swedish market, major concerns of food recalls, food safety and traceability are a reality (Kledal, 2003). This requires every supply chain member to be accountable in sourcing, handling, and quality control of food to prevent mishaps along the network that can ruin a firm’s reputation (Deloitte, 2014). Food safety measures and regulations need the input and collaboration of all concerned stakeholders (Lamming et al., 2001).

Despite the high consumer demand, market volatility is a key concern as organic products are characterised by perishability (short life cycles) and seasonal productions (Li et al., 2014). Such characteristics increase levels of uncertainty and risk on market prices and can have an impact for an entire OFSC, from farmers to consumers (Diabat, Govindan, & Panicker, 2012). The authors examined risks affecting OFSCs performance and proposed mitigation strategies to manage, reduce or prevent the aforementioned risk factors to ensure business continuity.

### 1.3. Purpose

Given the identified challenges along OFSCs that originate from the upstream, knowledge gaps exist on the appropriate risk mitigations to protect and secure supply chains. The organic market is continuously evolving and it is pertinent for firms adapt effective supply chain risk management (SCRM) to pinpoint critical vulnerabilities. This thesis focused on establishing how firms manage risks to ensure supply of organic products is not interrupted. In this regard, the purpose of this thesis is:

*To assess risks affecting suppliers and retailers of organic food and thereafter, propose risk mitigation strategies to prevent or minimise supply chain disruptions.*

The following two research questions are developed to fulfil this purpose:

**RQ1.** What are the risks faced by suppliers and retailers in an organic food supply chain?
**RQ2.** What strategies can be applied to mitigate identified risks?

To answer these research questions, case studies were conducted to gather empirical data through in-depth interviews and analysis of secondary data. Secondary data is accessible from the library databases, google scholar and the web.

### 1.4. Delimitations

The study focuses on small and medium sized firms that are keen to take advantage of opportunities in the current organic food market (OFM) given the high consumer demand and attractive commodity prices. These small-sized family owned enterprises specialise in providing more personalised services and sell products not regularly provided by big established suppliers and retail chains. Business owners of these enterprises were also eager to share their experiences of managing complex logistics processes involved in operating OFSCs. The authors do not focus on particular OF products traded in the Swedish OFM. The aforementioned factors are influenced by time constraints, as it is impractical to examine all food products, suppliers and retailers in the OFM. Exploring a small sample of actors enabled completion of this research study. The research findings should not be considered applicable to every risk scenario faced by different firms except those referred to in this thesis.

### 1.5. Definitions

Throughout this thesis, the authors use terms that are integral to understanding the subject area under study. It is relevant to define these terms for better understanding of how these concepts relate in the investigation of different scenarios within OFSCs.

#### 1.5.1. Organic food

Organic agriculture is defined by the IFOAM (2016) as "a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects." The practices that characterize organic farming that influence production outputs are 1) the use of strict limits on chemical synthetic pesticides, herbicides and synthetic fertiliser use, livestock antibiotics and hormones, food additives and processing aids. 2) Absolute prohibition of the use of genetically modified organisms. 3) Choosing plant and animal species that are resistant to diseases and adapted to local conditions (FIBL, 2016). The food that produced from using these practices is defined and labelled by local or international institutions as organic. An example is organic milk; cows are not treated with certain drugs, can graze and are fed on organic fodder (FIBL, 2016).

#### 1.5.2. Supply chain risks

Tummala and Schoenherr (2011) describe these risks as events with potential to affect supply chain performance objectives like network-wide service levels, responsiveness and efficiency. These extend beyond the boundaries of one firm and can be a source of supply chain risk (Juttner, 2005). Organisations integrate risk management as an essential part of a whole supply chain design (Christopher & Lee, 2004) to avoid harmful impacts of risks. Mitigating risk requires understanding different types of risks, their linkages, and impact on firms and their supply chains (Srivastava et al., 2015).
Most firms have complex and dynamic supply networks (Harland et al., 2003) which increases potential for risk occurrence across networks. Kleindorfer and Saad (2005) emphasize the importance of identifying sources of risk and vulnerability, their assessment and mitigation.

1.5.3. Supply Chain Risk Management (SCRM)
Norrman and Lindroth (2002) define SCRM as “a process in which channel partners collaborate in a supply chain to apply risk management process tools to deal with risks and uncertainties caused by, or affecting, logistics related activities or resources.” Norrman and Jansson, (2004) state that the more integrated supply chain networks become, the more potential for uncertainties and risks in one area affect the entire supply chain. Christopher et al., (2002) explain that supply chain vulnerability will only increase as more firms compete for resources, customers and increasingly depend on other firms to achieve performance objectives. Juttner et al., (2003) disclose that the objective of SCRM should be to “identify and manage risks, allowing a supply chain to reduce its vulnerability through a coordinated approach among its members.” SCRM should not only prevent risk occurrences but it should foster business continuity and mitigate any disruptions threatening normal business operations (ASIS International and BSI, 2010).
2. Frame of reference

This chapter provides a review of literature on categorisation of sources and description of internal, external and environmental risks that can affect supply chains. Supply and demand-related risks in the upstream and downstream respectively, of the food supply chain are discussed with a focus on risk identification and suggestion of mitigation strategies. Risks affecting suppliers in the upstream and retailers in the downstream are explored. Finally, a theoretical framework summarizes the main findings from analysis of secondary data.

2.1. Risk categorisation

The need to manage complex supply chains better and gain competitive advantage has made uncertainty, vulnerability and risk, key areas of focus in business management (Norrman & Lindroth, 2001; Christopher, et al., 2002; Lamming et al., 2001). Preparing risk management plans requires proper identification and understanding of risks and their impact on supply chain performance (Hiles & Barnes, 2001). In this thesis, a categorisation by Christopher and Peck (2004) is used to illustrate sources of supply chain risks. The specific risks and mitigation strategies discussed below have a direct effect on supply chains according to Manuj and Mentzer (2008) and these can affect performance of OFSCs as well.

2.1.1. Process and control risks

These are risk sources within a focal firm and arise out of logistics and production processes as well as managerial actions (Christopher & Peck, 2004). These affect value-adding processes and managerial tasks undertaken by a firm (Manuj & Mentzer, 2008). Christopher and Peck (2004) describe controls as "the assumptions, rules, systems and procedures governing how an organisation exerts control over the processes. Controls are the "order quantities, batch sizes, safety stock policies and procedures governing asset and transportation management. Control risks occur due to failure in applying these policies or control measures appropriately." Such risks vary from labour (strikes) or production (equipment failure, unreliable supply) to IT system failures (Ceryno et al., 2013).

2.1.2. Supply and demand risks

These risks comprise all risks emerging because of the actions of supply chain members (Juttner et al., 2002). These occur due to social and industry or market factors (volatility of consumer demand, supply constraints), political events and natural disasters (Chopra & Sodhi, 2004). Juttner, Christopher and Peck (2003) state that these are external to a focal firm but are internal to the inter-firm network through which material, products and information flow. These risks affect supply and demand, and can disrupt flow of information or products between a focal firm and the market (Sadghiani et al., 2015). This relates to processes, control, assets and infrastructure dependencies of firms downstream and those directly connected to the focal firm (Juttner et al., 2002).

2.1.3. Environmental risks

These characterise all the potential risks triggered by socio-political, macroeconomic or natural events (Christopher & Peck, 2004). These are external to the supply chain network and may directly affect a focal firm or firms in the upstream or downstream
(Christopher & Peck, 2004). Economic, socio-political or technological incidents can trigger these risks far away from a focal firm’s supply chain (Harland et al., 2003). In this thesis, authors focused on internal, external and environmental related risks to establish how these affect operations of OFSCs.

2.2. Risk Assessment

The assessment of risks affecting the supply chains has been a subject of many studies. Fiksel et al., (2015) examined six major vulnerability factors and approaches to control these weaknesses. Nyamah et al., (2014) explored a comprehensive list of general risks affecting an agricultural supply chain, and then ranked these by probability and severity. Vlajic et al., (2012) split risks between external and internal and ranked them by their controllability. Finally, Jaffee et al., (2010) categorized eight types of risks to investigate their transmission of impact at the downstream of a supply chain. In their study, Leat and Revoredo-Giha (2013) provide a framework introducing five risks faced by specific enterprises especially food producers and processors. These included production, price or market, institutional, human and financial risks.

A study by Leat and Revoredo-Giha (2013) is closely related to the aims of this research study. The following risks categories are adopted from a review of various studies and these specific risks are identified as having a direct impact on OFSCs. Food safety regulations, consumer concerns and related costs have resulted in more emphasis on risk identification and prevention (Fearne et al., 2001).

2.2.1. Sourcing risks

Local production of organic food is low and a constraint causing supply shortages (KRAV, 2016). This has resulted in an increased reliance on organic imports to make up for the local shortages (Ranninger, 2014). Food imports present challenges in safety and regulatory compliance as well as increased operation costs due to high commodity prices and transport costs (Ades et al., 2012). Globalisation has also created gaps in food supply chains making it challenging to effectively identify and manage risks like contaminations and food scandals (Maras, 2015). Chopra and Sodhi (2004) report that supply disruption risks can emerge from natural disasters, labour disputes, supplier bankruptcy, and acts of terrorism. They cite the case of UPF-Thompson, sole chassis supplier to Ford Motor Company’s Land Rover unit, who became bankrupt in 2001, which caused major supply challenges for the automaker. The perishable nature and short lifecycle of organic products poses another risk in a food supply network (Srivastava, Chaudhuri, & Srivastava, 2015). Perishable food products require more urgency in storage, processing and transportation across a supply chain from producers to end consumers (Ziggers & Trienekens, 1999). Natural factors such as bad weather conditions may hamper suppliers’ abilities to despatch the right quality of fresh food on time and fulfil customer orders (Sowinski, 2012). For firms, this creates and increases uncertainty with regard to food safety and supply reliability (Hobbs & Young, 2000). Srivastava et al., (2015) explain that failure to ensure availability of the right food quality at the right time and quantity in the right place are major constraints.

Failure to implement food traceability is a major sourcing risk (Elmsalmi & Hachicha, 2013). Firms need to be able to trace and retrieve product history (Srivastava et al., 2015). The ability to trace a product’s source and supply route supports food safety mechanisms
(Vorst & Jack, 2005). This is especially important during product recalls when safety problems occur. Market regulations require organisations to have traceability capabilities, as emphasized by national regulations (Engelseth, 2009). Ruben et al., (2007) examined key attributes in contractual agreements in a food supply chain which include; delivery schedules, order frequency, payment arrangements, consistent product quality, costings (price), transportation (temperature controlled), packaging, traceability, marketing, deterrent clauses in case of non-compliance and breach of contract. A poorly designed contract exposes a supply chain to non-compliance in form of poor quality products, pricing uncertainties, late deliveries and insufficient traceability (Ruben et al., 2007).

Delays, delivery constraints, poor coordination and insufficient information dissemination disrupt logistics activities (Sanchez-Rodrigues et al., 2010). According to Srivastava et al., (2015), inappropriate logistics practices result in manual handling of food increasing potential for food contamination or use of unsuitable transportation. Poor fleet maintenance can cause delays or breakdowns, requiring transfer of consignments from one vehicle to another (Joshi, Banwet, & Shankar, 2009). This increases potential for product theft, damages and cross-contamination.

2.2.2. Production risks
These occur when agriculture is “affected by many uncontrollable events such as extreme weather, pest and disease outbreaks” (Leat & Revoredo-Giha, 2013). According to Ogrustov et al. (2008), assessing catastrophic risks requires three dimensions; 1) the risk perception, which is the subjective perception of risk by decision-makers; 2) the risk attitude; the extent to which a decision-maker seeks to avoid risk or prefers to face risk; 3) the estimation of the probability and impact of catastrophes. In their study, Nyamah et al., (2014) examined different natural risk occurrences. The most likely to occur in Sweden are 1) Periodic deficit or excess rainfall; 2) Extreme drought; 3) Extreme cold; 4) Hailstorms; 5) Strong winds; and 6) Flooding. In addition, biological and environmental risks were identified such as; 1) Pests and diseases; 2) Contamination due to poor sanitation; 3) Human contamination and illnesses; 4) Contamination affecting food safety; 5) Contamination and degradation of production and processing methods. This output variability risk is one of the most important for farmers; “empirical research into farmers’ risk perceptions typically finds that farmers are primarily concerned with production and price output risk, with price ranking highest in nearly all studies” (Tangermann, 2011). A detail comparison between conventional and organic farming production variability is shown in Appendix 1.

2.2.3. Warehousing risks
There are security and traceability related issues in food product storage (Srivastava et al., 2015). In an OFSC, product safety and quality are major concerns arising from poor temperature management and fluctuations (Raab, et al., 2008). Logistics plays an integral role in a food supply chain and actions of third-party service providers can be a source of risks such as product damages. The use of third-party logistics providers may affect quantity and quality during transportation (Cai et al., 2013). Grievink et al., (2002) posit that seasonality in material production, critical conditioned transportation and storage procedures results in complex logistical planning and difficult transportation in organic food supply and retail. Negligence in maintaining refrigeration facilities may
compromise product safety norms and cause cross-contamination (Srivastava et al., 2015). Bogataj et al., (2005) contend that failure to maintain appropriate temperature controls in a supply chain will diminish the net present value of tasks and their benefit in a cold chain. A major fire outbreak poses a big risk to operations as this can lead to property loss and interruption of normal business (Axfood, 2016). When such a risk occurs, it can trigger supply risks for all partners further down in the supply chain network (Juttner, 2005).

### 2.2.4. Demand risks

diabat et al., (2012) describes these risks as those related to demand for a product. These may include firms lacking control of production and product sourcing that reduces control of network flexibility or production of their own brands (Adebanjo, 2009). Tang and Tomlin (2008) describe these risks as those affecting firms selling multiple products since demand volumes are uncertain and difficult to forecast. Consumers’ demand for a product can change abruptly owing to economic decline, changes in customer preferences, failure to communicate with customers or demand becoming more volatile (Tang, 2006). Market reports on health related issues like allergic reactions from animal products are an example though infrequent can adversely affect product demand (Oke & Gopalakrishnan, 2009). The avian flu in Asia and mad cow disease in the UK affected demand for dairy products (The Economist, 2013). These too, are infrequent but had protracted effects on demand for dairy products. Regulations in some countries ban sale of products containing prohibited substances like pesticides (Oke & Gopalakrishnan, 2009). This may have long term and critical effects such as increased operation costs and increased uncertainty. Long lead times, short product lifecycles, actions of intermediaries (Chopra & Sodhi, 2004) affect market forecasts, which can cause demand fluctuation. A ripple effect due to demand related risks may affect a supply chain resulting in performance failures (Lee, Whang, & Padmanabhan, 1997). Given the high local demand for organic food, there are potential risks of fraud where unscrupulous traders may try to sell conventional products as organic (KRAV, 2016). For firms, this poses reputational risks with serious financial implications and sanctions (Deloitte, 2014).

### 2.2.5. Price risks

Tangermann (2011) notes that “typical variability of output in agriculture also causes prices to fluctuate. [...] On the supply side, the time required to complete the production process, for crops typically a year, mean that output cannot be adjusted in the short run when the price changes.” On international markets, price fluctuations are even stronger because “world markets for most agricultural commodities are relatively narrow, with only a limited share of global production entering into international trade.” In Sweden, low production of organic food may be contributing to high purchase prices of products as traders try to manage supply constraints and consumer demand (KRAV, 2015). However, few farmers are converting to production of KRAV-certified food because of the extra costs involved (KRAV, 2016).

### 2.2.6. Financial risks

Leat & Revoredo-Giha (2013) describe these as the "fluctuations in interest rates on borrowed capital, or cash flow difficulties if there are insufficient funds to pay creditors.” Nyamah et al., (2014) further explain that this vulnerability may appear
depending on how financial flows are managed and controlled. This could be the consequence of the general lack of interest of financial intermediaries in agricultural production (Willer & Larnoud, 2016). The financial strength of the supply chain partners is critical to avoid disruptions (Vlajic et al., 2012). The exchange rate can affect profitability especially in Sweden where exports or imports are purchased in the Euro currency (Nyamah et al., 2014). Most agricultural producing countries in European Union (EU) currently use this currency (FIBL, 2016).

2.2.7. Institutional risks
Leat and Revoredo-Gilha (2013) characterize these by the changes in policies and regulations that affect firms involved in food trade. For example, unanticipated changes in regulation may add constraints in production; higher animal welfare standards may require more investments and a reduction in subsidies. Bourgeois (2008) describes the level of institutional risk as high in food supply chains because food quantity and quality are considered as strategic importance for countries that regulate the production and distribution processes. Bourgeois (2008) cites an example after Second World War when the need to protect farmers’ revenues emerged. He further states that this was enacted at national level in U.S. policy from 1933 and led to conception of the "Wheat office" in France in 1936. Indeed, price fluctuations in foreign imports can render local farmers less competitive and eventually bankrupt. It can take years to recover the initial level of production because of the single yearly harvest and the constraints of soil maintenance, tree development, and livestock farming. The Common Agricultural Policy embodies the mitigation of these risks from 1962 for the member states of the European Union. (Bourgeois, 2008).

2.3. Risk mitigation strategies
According to Jaffee et al., (2010), risks can be managed at different levels; on a firm level; collaboratively among members of a supply chain or through joint action with farmers and externally where banks, governments and insurance companies are involved. Vlajic et al., (2012) reviewed redesign principles aimed at preventing and reducing impact of supply chain disturbances. Fiksel et al., (2015) argues for a balanced risk management approach and states, “As vulnerabilities increase, companies are exposed to undue risks and have to improve corresponding mitigation capabilities. However, overinvestment in such capabilities may erode profits, so companies have to find the zone of balanced resilience where their portfolio of capabilities is matched to their pattern of vulnerabilities.” After a review of different mitigation strategies, the authors selected the following mitigation approaches based on suggestions from previous studies conducted and cited within the thesis literature.

2.3.1. Cultivation techniques
Local and international institutions have conducted extensive research on risk management in organic farming and developed policies such as the Rural Development Policy (FIBL & Bio Suisse, 2013). These policies are aimed at promoting resilience against production risks caused partly by poor cultivation practices; which makes permaculture a creative approach for risk control (Mcmanus, 2010; Ferguson et al., 2014). According to Mcmanus (2010), permaculture “claims to look at the whole system or problem; observe how the parts relate and connect; and design ways to fix the systematic problem in a long term sustainable manner.” Ferguson et al., (2014) argue
that the design system inherent to the discipline enhances resilience by utilizing “ecological and system-thinking principles, and spatial reasoning strategies, which are used to analyse site conditions, select practices, and integrate them with site conditions and land use goals”. Besides this, the analysis and understanding of the inputs like soil, water and sunlight are critical as these represent the upstream supply chain that involves producers and will determine the quality and quantity of outputs (Bourguignon & Bourguignon, 2008; Eyhorn, 2005).

2.3.2. Common Agricultural Policy (CAP)
The Common Agricultural Policy (CAP) accounts for 38% of the total EU budget, making this the first cost item (European Commission, 2015). In Sweden, the share of direct subsidies to farmers is about 83.7% of their net income (European Commission, 2013). These figures show the importance of public subsidies for EU farmers. The 2013 CAP general long-term objectives are to ensure viable food production, sustainable management of natural resources, climate action and a balanced territorial development. Appendix 2 details the CAP description that highlights the new Greening component that mandates states to use 30% of their national funding allocation to promote sustainability and organic farming (FIBL and IFOAM, 2016). Coturni (2014) reviewed some of the current instruments that mitigate risks faced by European farmers, either in the short run in the event of a crisis or long term because of poor land management. These instruments include 1) general income support through direct payments; 2) preservation of natural resources for agricultural production utilising the Greening and agriculture-climate measures; 3) crisis management using market instruments; 4) diversification; support for training and innovation and restoring investments through the Rural Development Policy; and finally 5) State Aid rules.

Article 36 of the European Union Regulation No 1305/2013 (2013) describes the insurance schemes of CAP contained into the second pillar of the Rural Development Policy. These consist of three elements:

1. Financial contributions to premiums for crop, animal and plant insurance against economic losses;
2. Financial contributions to mutual funds to pay financial compensations to farmers, for economic losses of at least 30% of the past production caused by adverse climatic events, caused by outbreaks of animal or plant disease or pest infestation or an environmental incident.
3. An income stabilisation tool, in the form of financial contributions to mutual funds, providing compensation to farmers for a severe drop in their income.

Finally, article 25 of European Union Regulation No 1306/2013 (2013) has a reserve of 400 million euros per year for major crises. A portion of these funds for example, was used to counteract the effects of the recent Russian embargo. In spite of the existence of these tools, Farm Europe (2016) acknowledges that these are not widely used by farmers due to their complexity and difficulties in practical application. According to European Commission (2015), these instruments should be fully implemented by the end of 2018 when the mid-term evaluation of CAP takes place. Besides these instruments, each state provides single risk or multiple risk insurances. In Sweden, such insurance schemes cover for weather-related risks among other risks.
2.3.3. Supply chain flexibility
Duclos et al. (2003) define supply chain flexibility as “the flexibility within and between all of the partners in the chain, including departments within and between an organisation, and the external partners, including suppliers, carriers, third-party companies, and information systems providers.” The increasing complexity of the food chains, value-added processes and the shortening of response times to demand changes are among key drivers of supply chain flexibility (Wilding, 1998). Managing complexity requires inter-firm coordination and this underlines the benefits of supply chain flexibility (Winkler, 2009). Tachizawa and Thomsen (2007) propose two strategies to increase flexibility of a supply chain: improved supplier flexibility and flexible sourcing. Gosling, Purvis and Naim (2009) describe supplier flexibility as the collective flexibilities provided by different suppliers in a supply chain and can be a combination of production, warehousing and transport flexibilities. Sourcing flexibility is concerned with regularly reconfiguring the supply chain at a low cost and involves adoption of a larger supplier base (Tachizawa & Thomsen, 2007). Lee (2004) suggests integrating agility in a supply chain to enable a firm reduce impact of short-term changes in demand or supply. With a larger supplier base, a firm has options of ordering from suppliers with the lowest costs to ensure supply flexibility to offset supply uncertainty (Tang & Tomlin, 2008). To mitigate supplier commitment risks, Tsay and Lovejoy (1999) recommend the use of flexible supplier contracts that allow upward or downward adjustment of products or services offered. Tang and Tomlin (2008) suggest developing a portfolio of suppliers with flexible supply contracts, long-term inflexible supply contracts at low costs and more flexible contracts at higher costs. This offers operational flexibility to adapt and reduce supply risks, including currency exchange risks at supplier bases (Kouvelis, Dong, & Su, 2006).

2.3.4. Supply chain visibility
Modern food supply chains are increasingly extensive due to global nature of production locations, processing, packaging and markets (Hersh & Shaw, 2009) which makes tracking product information from farm to end consumers very complicated (Trace One, 2014). Supply chain visibility provides information to satisfy consumers’ increasing demand for reliable information regarding product origins, ingredients, processes, and practices associated with food they purchase (Susan, 2012). Consumers purchase products based on their specific needs and values such as; allergens free foods, carbon footprint, sustainable agriculture and fair labour practises (Maras, 2015). Food regulations are also increasing the need for firms to enhance network visibility (Fernandez, 2014). Firms stand to gain business benefits when they can better understand critical information of internal firm processes as well as know where food products originate from or points of sale and consumption (Susan, 2012). Product recalls and contaminations have significantly heightened consumer concerns about food safety and eroded consumer trust (Roth et al., 2008). In this case, supply chain visibility helps create transparency necessary to re-establish trust with consumers (Bailey, 2013).

Traceability is a key feature enabling supply chain visibility (Regattieri, Gamberi, & Manzini, 2007). Wilson and Clarke (1998) define food traceability as that “information necessary to describe the production history of food products and any subsequent transformations or processes that the products might be subject to on the journey from
the producers to the consumers plate.” EU mandates food operators to identify and document information on suppliers, customers, products and date of delivery (European Commission, 2007). Organic products are labelled according to the European Union Regulation 834/2007 (2007), which is the use of a logo and a code that describes the country of origin, the production method and a reference number (European Commission, 2015).

2.3.5. Certification
A number of certifications are available to ensure food safety and to promote trust and confidence among consumers of organic products (European Union, 2007). Examples of these certifications include the IFOAM Norms (FIBL and IFOAM, 2016). In European Union (EU), Regulation 834/2007 defines the features of organic farming and products, the production rules, control systems, labelling, and trade applicable within EU region. The Codex Alimentarius from the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) defines “international food standards, guidelines and codes of practice” (FAO, 2016). Most countries have a national certifier. In Sweden, KRAV certification has gained popularity since its creation in 1985 with a consumer awareness of 98% (KRAV, 2015). It has 27 members representing 4000 farmers and 2000 companies in processing and trade. To be certified, applicants must comply with more requirements than at EU level. These include social justice requirements preventing human rights violations, involuntary labour, protection of old-growth and natural forests and a maximum level of Genetically Modified Organisms (GMO) of 0.1%. (KRAV, 2015)

The European Union Regulation No 834/2007 (2007) defines the legal framework that aims at “ensuring fair competition and a proper functioning of the internal market in organic products, and of maintaining and justifying consumer confidence in products labelled as organic.” To use the organic logo, a producer must comply with a set of food regulations. Every supply chain actor undergoes inspection at least once a year or more depending on specific risks. EU legislation for organic products will be reviewed as illustrated in Appendix 3. The objective is to nurture consumers' trust in a growing OFM. IFOAM EU Group (2014) emphasizes the need for these changes to address administrative challenges since “in some countries, we are facing a growing gap between demand for and production of organic foods”. Some measures proposed are: revocation of certification if pesticides limits are exceeded, with concurrent organic and non-organic farming, small-scale farmers could be certified as a group. (IFOAM EU Group, 2014; FIBL and IFOAM, 2016)

Financial costs deter some producers from seeking certifications (KRAV, 2015). However, there are solutions for cost reduction and risks sharing. Internal Control Systems (ICS) are “part of a documented quality assurance system that allows an external certification body to delegate the periodic inspection of individual group members to an identified body or unit within the certified operator” (IFOAM, 2014). The delegated authority is responsible for checking internal compliance with the regulations. The European Commission has addressed the group certification issue, stating that a “system of group certification is introduced for small-scale farmers in the Union with a view to reduce inspection and certification costs and associated administrative burden, strengthening local networks, contributing to better market
outlets, and ensuring a level playing field with operators in third countries.” (European Commission, 2014).

2.3.6. Demand management
Marketing programs aimed at increasing sales may reduce short to medium term demand especially for online shoppers. Better coordination of marketing efforts with suppliers helps mitigate this risk (Oke & Gopalakrishnan, 2009). Oberholtzer, Dimitri, and Jaenicke (2014) suggest a well-designed and tested communication strategy will enable communication with consumers and provide assurances in case of product safety issues. This presents an opportunity for a firm to educate consumers about any safety concerns and what is being done to address the problem (Narasimhan & Das, 1999). Retail firms can also seek government authorities to diminish the impact of a risk threatening public safety. Firms need to enhance surveillance on demand related risks or those likely to affect supply chain partners (Blackhurst et al., 2005). It may not be possible to identify potential sources of risks but improved monitoring of the supply chain network should provide early warning signs of actual risks (Harland et al., 2003). In cases where products from certain countries are banned, collaboration with concerned supply chain partners is necessary to establish flexible mechanisms to substitute products fast enough (Kottila, 2005).

2.3.7. Horizontal and vertical cooperation
According to Li et al., (2015), “relevant prior studies highlight the importance of coordination and collaboration among supply chain partners for successful SCRM.” Also, “as uncertainty increases, we expect closer forms of vertical co-ordination to be selected over open market transactions because of increased information and monitoring costs” (Hobbs & Young, 2000). Simatupang et al., (2002) identify different four strategies that enhance that include logistics synchronisation, information sharing, incentive alignment and collective learning. Pieter et al., (2008) suggest four strategies food suppliers can use to address uncertainty in demand and manufacturing inherent to the perishability of food. These include 1) Buyer-focused operations; that involves selecting and keeping resources and production capacities to fulfil the orders of one buyer, so that the buyer pulls the demand. 2) Virtual buyer focused operations; which entails the allocation of resources on a fixed time basis, mainly used to decrease manufacturing uncertainties. 3) Aggregated hierarchical planning; that affects production capacities of a collection of products, a suitable organizational measure to deal with uncertainty of demand within product types. 4) Integrated planning and scheduling decisions based on algorithms that use data to optimize the production and packaging processes.

In horizontal cooperation, Jaffee et al., (2010) suggest private collective action of cooperatives as an instrument to manage risk at a producer level. The International Cooperative Alliance (2016) defines a cooperative as “an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly owned and democratically-controlled enterprise.” According to Ortmann and King (2007), three types of cooperatives can help mitigate production and financial risks and these include; marketing cooperatives (bargain for better prices, handling, processing or manufacture, and sell farm products), farm supply cooperatives (purchase in volume, manufacture, process or formulate, and distribute
farm supplies and inputs) and service cooperatives (provide services such as trucking, storage, irrigation, credit, utilities, and insurance). However, organic producers that wish to create a cooperative should be aware of some limits. Cook (1995) and Royer (1999) mainly cite the diverging interest of members and the lack of control. As a response to these limits, a form of cooperative; New Generation Cooperative (NGC) has allowed farmers to move up the supply chain even further and sell their products directly to end-consumers. Coltrain (2000) describes this in Appendix 4. This model of cooperative is applied in niche markets to integrate some parts of the vertical food supply chain. Nilsson (1997) states that “NGC model implies far-reaching vertical integration, giving the farmer larger earnings through selling processed products instead of raw products. Through production contracts, granting delivery rights and delivery obligations, all business functions can be streamlined. The huge amounts of money needed for constructing the production plants is attained through direct investments from the members.”

Community-Supported Agriculture (CSA) is an example of vertical cooperation and the most basic type of integration (Feagan & Henderson, 2009). Feagan and Henderson (2009) further add that CSA as an organization model “shares farming risks between producers and consumers.” Burke (2012) describes CSA as “a core group of people, mostly non-farmers that pool resources to hire a producer or farmer. [...] The cost of membership is not related to the value of the food received, but rather the costs of the farming operation.” More information on CSA are available in Appendix 5.

2.3.8. Supplier-buyer relationships

Seller and buyer relationships are an integral part of business operations and these have become strategic and augmented as firms endeavour to create partnerships to achieve business targets (Wilson D. T., 1995). Firms achieve competitive advantage with relationships and linkages created with external organisations (Gadde & Snehota, 2000). Sourcing of products from across global markets is a common trend (Chopra & Sodhi, 2004) and market actors in Sweden trade in organic food locally and internationally (Krav, 2015). However, firms and their supply chains are exposed to risks and challenges such as unreliable suppliers, pilferage and product damage (Christopher et al., 2002).

Dyer and Singh (1998) suggest collaborative learning in inter-firm relationships to manage risks and as a potential source of competitive advantage. Spekman et al., (2002) support this view and argue that knowledge transfer between firms in a supply chain is a core competence and also a source of competitive advantage. Hallikas et al., (2005) argue that collaborative learning is a possible way of jointly managing, reducing and eliminating risks related to supplier relationships.

Bessant et al., (2003) advocate for continuous learning within and between firms as a key strategic requirement for building and sustaining competitiveness in an uncertain environment. However, Powell (1998) cautions that learning among supply chain partners is a complex process requiring learning from and with partners. This learning process also involves learning partners’ behaviours, developing routines and norms that help mitigate risks of opportunism and learning how to distribute newly acquired knowledge across a firm (Harland et al., 2003). Hallikas et al., (2004) propose mutual identification and prioritisation of risks likely to affect optimal performance of a supply chain network. They argue that identifying and implementing mutual means of risk
mitigation enables firms find out risk mitigation plans that may be costly to be implemented by a single partner, but cheap to be implemented by collaboration. Christopher et al., (2011) emphasize that collaboration enhances visibility especially in a global context, making a supply chain more agile. Christopher and Peck (2004) state “...the management of risk has to be network-wide too.” Supply chain partners working collaboratively within the sourcing network (Hallikas & Lintukangas, 2016) can manage global sourcing risks. Supply chain relationships based on trust, transparency of information and cooperation between buyers and suppliers can significantly help mitigate risks (Tang, 2006). Cox (2001) argues that food retailing is characterized by “a power regime of buyer dominance or buyer-seller interdependence.” The power regime is amenable to proactive supply development where a buyer fosters innovation by working with a supplier rather than rely on indirect market advantage to encourage breakthroughs in a relationship between cost and quality on their own (Cox, 2001).

2.3.9. Business Continuity Planning (BCP)

Broder and Tucker (2012) describe BCP as “a process that identifies the critical functions of an organisation and that develops strategies to continue these functions without interruption or minimise the effects of an outage or loss of service provided by these functions.” Business continuity should be incorporated into risk management processes and integrated within a firm’s operations and culture (Faerstes, 2015). Cerullo and Cerullo (2004) recommend the use and integration of three components into a BCP; business impact analysis (BIA), disaster contingency recovery plan (DCRP) and train and testing. BIA identifies critical functions a firm must perform to continue business operations such as identify risks posing critical hazards to key business functions and rate these risks according to likelihood of occurrence and their impact (Craig & Kevin, 2007). Additionally, a BIA will also guide decision-making on if to avoid, mitigate or absorb certain risks and helps in identifying appropriate methods to avoid or mitigate risks (Hitt, Wu, & Zhou, 2002). DCRP specifies procedures to perform when a risk occurs which include: identification of primary and substitute workers and their duties, notification procedures and work-around processes to sustain firm operations while disrupted services or damaged resources are restored (Castillo, 2004). These procedures also involve identification of all local and foreign suppliers with their contacts. Training and testing enables a firm determine whether the BCP is effective to address critical risks (Cerullo & Cerullo, 2004). Training prepares employees to know what to do during an actual crisis should be conducted under realistic situations to develop confidence to avoid panic during a crisis respond (Altay & Green, 2006). For an OFSC, a BCP should incorporate features addressing food safety, quality and traceability to prepare for potential operational risks (Peck, 2006).
2.4. Theoretical Framework

Risk management for an actor in a Swedish organic food supply chain

RQ1: Risk Assessment
- Sourcing
- Production
- Warehousing
- Demand
- Price
- Financial
- Institutional

RQ2: Risk Mitigation
- Cultivation techniques
- CAP
- Supply chain flexibility
- Supply chain visibility
- Certification
- Demand management
- Horizontal & vertical cooperation
- Supplier-buyer relationships
- Business continuity planning (BCP)

Figure 1: Theoretical framework

Research question 1: risk assessment
Vlajic et al., (2012) and Jaffee et al., (2010) explored extensive frameworks applicable to food networks. However, with the upstream of a supply chain, a categorization by Leat and Revoredo-Giha (2013) is derived and considered appropriate for its comprehensiveness. The categories of risks identified that could have an impact on organic food suppliers and retailers are sourcing, production, warehousing, demand, price, financial and institutional.

Christopher and Peck, (2004) categorised potential sources of risks that influence how any other supply chain operates besides an OFSC. These comprised sources internal to a focal firm, sub-categorised into process risks and control risks. Secondly, risks external to a focal firm but are internal to a supply chain network, which are sub-categorised into demand or supply risks. Lastly, environment risks occur due to political events, acts of terrorism or natural factors. Kleindorfer and Saad (2005) classified supply chain risks based on risks arising from coordinating supply and demand, and risks emerging from disruption of regular operations. This theoretical framework (figure 1) provides a practical insight for risk management in OFSCs. It highlights key supply chain factors and processes fundamental in managing risks.

Research Question 2: risk mitigation
The suppliers can mitigate these risks using different strategies cited from various studies. Assessment with identification of risks is vital to formulate appropriate mitigation strategies. These can be implemented at different levels, from a firm’s level to a network perspective that may involve other entities like government authorities. Preventive inventions can also be applied before risks occurs or just after. These
solutions involve a trade-off provided by Fiksel et al., (2015) that is; investments for controlling risks may threaten the financial stability of a firm and thus become a risk itself. Prioritization of risk mitigation investments is essential for every firm.

The solutions found emphasize consideration of government action. As result of the importance and value of an agricultural sector for nations, there are implementing control bodies, legislations, insurance schemes, and subsidies approved in the European Agricultural Policy. A change in legislation or a non-compliance with regulation can erode profits and lead to bankruptcy. This thesis partly describes the roles and mandates of relevant national and regional agricultural authorities and associated policies. Firms trading in organic food products can enhance resilience utilising resourceful information from this study research and institutions cited such as the IFOAM, FIBL, KRAV, universities and use of emerging techniques like permaculture. Horizontal or vertical collaboration enables creation of cooperatives and integration of the upstream and downstream members respectively. This increases resilience as illustrated by Leat and Revoredo-Giha (2013); Li et al., (2015) and Hobbs and Young (2000). Other mitigations strategies used to address supply risks are supply chain visibility and flexibility, which enables end-to-end visibility and adaptability of a network. Demand management enables firms address risks related to demand for a product or service. Supplier-buyer relationships are critical for collaboration and coordination in supply chains, and business continuity planning (BCP) enhances firm’s capability to sustain operations even when risks affect the normal business operations.
3. Research Methodology

This chapter argues for the research design with regard to the study purpose. First, the interpretivist philosophy and theoretical assumptions are argued for in relation to the inductive approach. These assumptions inform the research approach and strategy adopted in this thesis. Data collection methods are reviewed considering the techniques utilised to collect and analyse empirical data. Lastly, research quality is presented.

According to Saunders, Lewis and Thornhill (2012, p. 585) research methodology is the ‘(…) the theory of how research should be undertaken, including the theoretical and philosophical assumptions upon which research is based on and the implications of these for the method or methods adopted’. Figure 2 below depicts the research methodology.

3.1. Research philosophy

Research philosophy according to Saunders et al., (2012), concerns the “development of knowledge and nature of that knowledge”. Bryman and Bell (2011) mention that research philosophy can be classified into epistemological and ontological viewpoints. Ontology is concerned with the nature of social reality whereas epistemology manifests what can be identified as acceptable knowledge (Bryman & Bell, 2011). Distinct philosophical views can be followed in research as regards ontology and epistemology.

Saunders et al., (2012) distinguish the various positions into interpretivism, positivism, realism and pragmatism. Saunders et al., (2012) claim positivism can be viewed as identical to a natural scientist’s stance. A positivist utilises extant theory to generate assumptions that are tested and validated or rejected. A realist differs from a positivist in that reality is observed as separate from the human mind (Saunders et al., 2012). Pragmatism largely concerns more the significance of the research question. Pragmatism fits a research study if the research question implies two philosophical views (Saunders et al., 2012). This thesis follows an interpretivistic philosophy. Bryman and Bell (2011) explain that an interpretivistic ontological view explains and separates social entities from phenomena of natural science. This view portrays the social world as overly complex to comprehend through a positivist position (Saunders et al., 2012). An interpretivistic epistemological perspective asserts that premises and law-like generalisations undermine the perception of the intricate society (Saunders et al., 2012). Additionally, Sanders et al., (2012) also contend that a researcher cannot be entirely objective with a positivistic stance.

The research study is comparatively complex with different organisational factors and processes involved as well as a purpose that cannot be realised through law-like assumptions. An interpretivistic ontological and epistemological perspective helps to understand the social interaction amidst different processes and actors in the setting of
the OFM. This research study explored subjective interpretations, social phenomena, not causal relations, and extensive samples. The time constraints prohibit adopting a pragmatic philosophy with a mixed method to collect and explain findings from data derived from diverse opinions. The limited timeframe does not enable examination of the phenomena under study using the multiple methods design.

3.2. Research purpose
Saunders et al., (2016) suggest that achieving research objectives necessitates a strong grasp of the type of research design. When a researcher establishes a research design, three distinct research purpose classifications come to mind and that is; descriptive, explanatory and exploratory (Saunders et al., 2012). According to Saunders et al., (2012) an exploratory study examines recent revelations to understand diverse phenomena from different views. Exploratory studies offer flexibility and adaptability to change in case new insights emerge during the course of conducting research. A descriptive study illustrates exact account of events and actions. Explanatory studies strive to discover causal connections between particular variables (Saunders et al., 2012).

Given the attributes of this research, an exploratory study is considered. There are limited theoretical narratives regarding present-day risk management approaches in securing OFSCs comprised of small and medium-sized firms within the Swedish OFM. A dynamic market environment results in challenges of establishing the best risk assessment and mitigation measures applicable in an evolving OFM scene. An exploratory study enabled broad investigations into supply chain risks and mitigation plans for identified firms operating in the OF industry. In contrast, an explanatory or descriptive approach is convenient for a study based largely, on additional adept theories providing a better understanding of anticipated outcomes of research questions.

Saunders et al., (2012) contend that an exploratory study allows researchers ask open questions to understand phenomena investigated. They argue that exploratory studies provide more insight of a problem especially if unsure of the exact nature of the problem. A descriptive study may not enable understanding of relevant themes on risk assessment and mitigation in the Swedish OFM. Saunders et al., (2012) state that to conduct an exploratory study, relevant experts (identified participants) are interviewed which has been done for this study.

3.3. Research approach
There are three research approaches namely; deductive, inductive and abductive (Saunders et al., 2012). These approaches influence the whole research design (Saunders et al., 2012). With a deductive approach, theory is generated by testing hypotheses based on extant literature. Saunders et al., (2012) argue that a deductive approach relates to how natural scientists conduct their research. According to Saunders et al., (2012) deduction reasoning does not portray how individuals understand the social world. An inductive approach, however, does allow interpretation of phenomena and enables develop new theory from collected empirical data (Saunders et al., 2016). The abductive approach is used when both deductive and inductive reasoning are used interchangeably to examine existing theory and collected empirical data to establish relevant patterns and themes (Saunders et al., 2012).
To fulfil the purpose of this study, an inductive has been preferred. An inductive approach is applied to generate new theory emerging from empirical data on risks in an OFSCs and risk management in the OFM. A deductive approach is not appropriate for this purpose since it emphasizes on causality whereas the inductive approach explores new phenomena from different perspective. The inductive approach is suitable when using research questions that narrow down the scope of the study. This approach is also closely associated with qualitative research whilst deductive approach is mostly associated with quantitative research. To derive better understanding of the phenomena studied, existing literature on risk assessment and mitigation in food supply chains was reviewed. Empirical data was collected and analysed to develop new theoretical understanding of risks in organic food chains. Identification of risks guided on determining the most appropriate mitigation strategies to fulfil the purpose of this study. Time constraints and challenges in gaining access to the identified participants together with the nature of inductive approach limited the authors from collecting and analysing additional empirical data.

3.4. Qualitative research

Saunders et al., (2012) name three views through which techniques can be investigated; quantitative, qualitative and mixed-methods. Jackson (2008) argues that qualitative research focuses on understanding the research problem not the quantity of observed phenomena (Strauss & Corbin, 1994). Denzin and Lincoln (2011) claim that in qualitative research, since authors consider social reality a human imagination, they interpret meanings from other people’s beliefs and practises.

The authors use the qualitative approach as non-numerical data is utilised to develop new theoretical understanding of the phenomena studied (Saunders et al., 2012). This involves establishing meanings of social interactions between actors and processes influencing these interactions. The authors justify using qualitative approach based mainly on non-numerical data necessary to study a phenomenon (Blumberg et al., 2008). Blumberg et al., (2008) add that while quantitative research relies on figures and numerical data, qualitative studies are based on narratives, words and sentences. Qualitative is the “meaning, the definition or analogy or model or metaphor characterising something, whereas quantitative assumes the meaning and refers to a measure of it” (Blumberg et al., 2008). The authors negotiated physical access to identified participants and built rapport with them (Saunders et al., 2012). In addition, sensitivity was observed to gain cognitive access to information needed. Qualitative research enables the authors explore phenomena of interest in their context employing different data sources (Baxter & Jack, 2008). The phenomena, in this case risks in OFSCs, were examined from different angles enabling authors answer the research questions using patterns revealed from empirical findings.

3.5. Research strategy

A consistent research strategy was maintained when collecting empirical data to fulfil the purpose of this thesis as emphasized by Saunders et al., (2012). Yin (2014) claims a research strategy explains a plan of actions on how research questions were answered to achieve the study objective. A research strategy can be chosen depending on the purpose
of the study which may be, as discussed earlier, either explanatory, descriptive or exploratory (Yin, 2014). Experiments, survey, case study, action research, grounded theory and archival research are familiar research strategies (Saunders et al., 2012). In this thesis, a case study strategy is employed to explore the phenomena studied (Saunders et al., 2012). In this case, risks assessment and risk mitigations in the context of organic food networks were studied. Retailers and suppliers as actors operate and interact in a Swedish context. Yin (2013:16) defines a case study as ‘an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not evident; and in which multiple sources of evidence are used.’ Case study research is commonly based on multiple sources of information known as triangulation (Saunders et al., 2012). Boundaries between the phenomena studied and their context is not clearly visible (Yin, 2009). A case study strategy fits this research study and the Swedish OFM is a real-life context where selected retailers and suppliers operate in. Access was negotiated with identified participants to schedule and conduct interviews. The data collected from these interviews provided more insight on the subject area under study (Eisenhardt and Graebner, 2007). This enabled authors to answer the research questions (Saunders et al., 2012) to fulfil the purpose of this thesis. A survey was not appropriate for this study since understanding a situation is restricted due to many variables involved (Saunders et al., 2012).

3.6. Research design

According to Yin (2014), a case study can be conducted in four methods based on two dimensions:

- Single case vs multiple case
- Holistic case vs embedded case

A case study research emphasizes the embeddedness of the phenomenon in its real-life context (Blumberg, Cooper, & Schindler, 2008). With this study, the authors used a multiple case study because six cases were investigated. A multiple case study involves several cases and Yin (2013) posits that two variations are not very different in their methodological features. Multiple cases are advantageous since these involve several cases; these provide more durable and convincing findings (Herriott & Firestone, 1983). As a multiple case study, cases were selected to forecast related results or predict divergent outcomes that were expected. Either way, this suggests that a multiple case study should embrace a reproduction reasoning. Yin (2013, p. 53-56) argues for decision making on the choice of an embedded or holistic design of a multiple case study. The embedded case study handles the sections within a case differently, generating sub-sections. These sub-sections are helpful when collecting various narrations of related experiences. A researcher has to be careful not to devote much attention on the sub-sections while forgetting the whole case study. A holistic case study design is commonly adopted and suitable when the research questions are generally applicable. Additionally, such a design is useful if it is not known that there are various subsections in a case study. The authors adopted the holistic case approach where specific cases where examined separately to establish an understanding of supply chain risks and risk mitigations in each firm selected.
Yin (2013) identified preferable qualities to ensure a high quality case study. He argues for in-depth understanding of the topic. Researchers should avoid biases and use good listening skills. In this study, authors are not be confined to predetermined suggestions. This is directly related to capacity to compose and ask relevant questions and clarify these sensibly. This is crucial in an open-ended situation, guarding against leading questions. In this study, the authors adopt a multiple case study design with a holistic design and a short case study interview guide. The interviews had a duration of between 20 to 120 minutes, the openness and willingness of the interviewees influenced the duration of these interviews. The authors endeavoured to avoid any leading questions to give participants time and space to provide their own narratives about the phenomena under study.

3.7. Time horizon

This research thesis analyses specific phenomena within a given timeframe. Due to time limitations, the authors do not conduct a longitudinal study hence the thesis is cross-sectional (Saunders et al., 2012). The authors strived to conduct the study within allocated timeframes using the case study strategy as explained previously. Semi-structured interviews were scheduled and conducted over a given period to gather relevant empirical data. Longitudinal research studies require a lot time to conduct and complete hence the authors did not pursue this to accomplish this study’s purpose.

3.8. Data collection

With regard to risk assessment and risk management, reviewed literature reveals that the majority of the studies conducted by Manuj and Mentzer (2008) or Leat and Revoredo-Giha (2013), used a combination of secondary data and interviews data. It is mainly from field observations reported by participants, which is the basis of developing frameworks. Since the purpose of this thesis is similar though with a different context, the authors conducted interviews with identified participants. Whenever possible, triangulation was used that is; collection of data from multiple sources like interviews, direct observation and analysis of secondary data from journals, reports, use of the web.

As a result, primary data was collected with the aid of semi-structured or in-depth interviews. According to Saunders et al., (2012), this type of interviews provide the opportunity to probe answers for clarification. This feature is useful for elaboration on how different risks affect firms and what mitigation strategies are appropriate. Semi-structured or in-depth interviews are also likely to be needed when it is necessary to understand “the reasons for the decisions that your research participants have taken, or to understand the reasons for their attitude and opinions” (Saunders et al., 2012). Further to this, such interviews provide a researcher with rich and detailed answers. This was particularly valuable for the topic of this thesis since there are various categories of risks and complex legislations discussed. Secondary data was accessed using search google scholar and the university library Scopus database. This enabled access to different academic journals, articles and useful websites.

The interview guide

The authors designed and used an interview guide that facilitated collection of relevant empirical data. This data assisted in answering the research questions to fulfil the overall
purpose of this thesis. Since the research is investigated from a supplier and retailer perspective, the interview guide is formulated with this in mind. The supply and retail considerations have questions focusing on key themes such as: Supplier-buyer relationship, Swedish food retail context, Organic food retail, Supply chain integration, Supply chain visibility, Price and demand fluctuations, regulatory issues, organic Risk management approaches.

To arrange the interviews, the authors identified companies operating in supply or retail of organic food. Internet research enabled analysis of Swedish firms involved in organic fairs in Europe. The identified participants were contacted where the purpose and objective of the interviews was explained. With their consent, these interviews were audio-recorded to gather every relevant details. Research participants were given assurances as regards to their anonymity and confidentiality of information they provided (Saunders et al., 2012, pp. 222-225). The interviews dealt with questions on firm backgrounds, internal and external risks, and the value of risk management with regard to mitigating different risks. Besides these themes, specific activity-related questions were seek a better understanding of how risk management differs from firm to firm. Finally, the structure and certain elements were inspired from an interview schedule conducted by Peck (2006a).

Approximately 40 companies were contacted to negotiate for access to schedule interviews. However, only seven firms responded positively and agreed to conduct these interviews at their office premises. The main reasons cited for the denial of access from other firms were; lack of time and interest and for most part, the big companies mentioned that they had their own internal research projects, which they preferred focusing on. The firms interviewed comprised of small and medium-sized supply and retail firms. This enabled analysis of their respective supply chains though it was not possible to focus on a particular range of products. Figure 3 below shows details of the interviews and respondents, who are anonymised.

<table>
<thead>
<tr>
<th>Company</th>
<th>Participants</th>
<th>Date</th>
<th>Duration in minutes</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retailer A</td>
<td>CEO</td>
<td>22-04-2016</td>
<td>30</td>
<td>Phone</td>
</tr>
<tr>
<td>Retailer B</td>
<td>Business Owner</td>
<td>28-04-2016</td>
<td>70</td>
<td>Face-to-Face</td>
</tr>
<tr>
<td>Retailer C</td>
<td>Buyer</td>
<td>27-04-2016</td>
<td>40</td>
<td>Face-to-Face</td>
</tr>
<tr>
<td>Supplier A</td>
<td>Purchase Advisor</td>
<td>04-05-2016</td>
<td>100</td>
<td>Face-to-Face</td>
</tr>
<tr>
<td>Supplier B</td>
<td>CEO</td>
<td>08-04-2016</td>
<td>120</td>
<td>Face-to-Face</td>
</tr>
<tr>
<td>Supplier C</td>
<td>Business Owner</td>
<td>16-04-2016</td>
<td>120</td>
<td>Face-to-Face</td>
</tr>
<tr>
<td>Ekoweb</td>
<td>Editor</td>
<td>12-04-2016</td>
<td>20</td>
<td>Phone</td>
</tr>
</tbody>
</table>

*Figure 3: Overview of companies*

### 3.9. Data analysis

The analysis depends on the type of empirical data collected and objectives of the research. According to Saunders et al., (2012), “since words from qualitative research
may have multiple meanings as well as unclear meanings, it is necessary to explore and clarify these with great care.” The interview data collected was transcribed to establish relevant patterns that were categorized to derive meanings from original data (Saunders et al., 2012, p. 557). The transcription involved data sampling, implying that only the most pertinent sections of the audio are kept. This data was summarized to establish a clear structure relevant to the study for further analysis. The categorized data was unitized that is; attaching key words and themes to appropriate categories devised.

These unitized data helped to refine and develop the initial theoretical-based framework, derived from the frame of reference. This procedure is pattern matching and is used for case study analysis where a conceptual or analytical framework that uses existing theory is developed and tested to ensure its relevancy to support the findings (Saunders et al., 2012). The analysis of empirical data collected was done by comparing the categories of the initial framework and the categories derived from the empirical data. Any mismatch or new elements are the basis of alternative explanations that further improve the theoretical framework. The analysis process, as suggested by Lee and Lings (2008), was conducted subsequently after data categorisation to avoid a pile up of work given the time constraints mentioned earlier in this thesis. This also allowed modification of some parts of the analysed data as new patterns were discovered.

### 3.10. Research quality

Blumberg et al., (2008) recommends formulation of a concise purpose which has been the basis for this research design. This design was carefully planned to ensure case selections are relevant for the purpose of this thesis to ensure that empirical data could be obtained. Ethical standards such as respect for the interviewees’ rights and creditable reporting of the findings were complied with. Other aspects like limitations, adequate analysis, presentation of findings and justified conclusion are considered. Saunders et al., (2012) mention that the importance of establishing gaining sufficient knowledge on the selected case companies. In addition to establishing how respondents operate, nature of opening comments, questioning style, mutual behaviour, etc.). The application of these mentioned facts will he validity is ensured, since the data collected should be clear and fully understandable.

**Reliability**

According to Saunders et al., (2012), this relates to how a research study is conducted and how data is collected and analysed. If different researchers attempt to conduct a similar study, the results may be different. Three bias can emerge from different sources: an interviewer who may lack credibility, consistency in his/her questioning or is unable to maintain objectivity. An interviewee may not answer questions fully due to the sensitivity of information discussed or because they prefer keeping a positive image. In addition, participation bias can emerge from inability of the researchers to interview the entire selected sample. This reliability is ensured through different means: the use of a research design, most of the interviewees that have been in the organic business for decades, many studies or reports have been read by the researchers and the data has been transcribed then approved by the interviewees.

**Validity**

The researchers must show that the data they use to answer their purpose is actually
relevant for phenomena studied and ensure correct analysis of data collected (Saunders et al., 2012). This study has used many frameworks that have been previously tested for risk assessment in the context of food supply chains, so that the indicators are directly related to the purpose.

**Transferability**
Bryman and Bell (2015) argue that this concept is concerned with if the study findings can be applied to different contexts. The results are replicable in the limits defined by the delimitations. Therefore, these would be relevant for actors such as suppliers or retailers of OF in Sweden. It is also important to keep in mind the complex and dynamic environment of practices and regulations that evolve which may change the applicability of the findings.

**Ethics**
Saunders et al., (2012) define ethics as a standard of behaviour concerned by the rights of the subjects of the study. This concerns integrity and objectivity of researchers, respect for others, and avoidance of harm, privacy and respect of the participants’ confidentiality and anonymity when requested. These attributes must be complied with to ensure the credibility and the quality of the study. In the context of risk management, companies may be reluctant to share information on risk mitigation strategies especially if such information affects market competitive advantage. In addition, organisations may not be willing to provide any information on risks or mitigation measures due to fear of such information falling in the grasp of competitors. This re-enforces the urgency and need to provide assurance to the companies and participants when conducting interviews. This is why confidentiality and anonymity are strongly emphasized.
4. Empirical Findings

In this chapter, findings are presented from the interviews conducted. The names and identities of the respondents and the business firms that participated in these interviews are anonymised for confidentiality reasons as per the research ethics.

4.1. Presentation of respondents

Retailer A
Retailer A operates in Stockholm, offering customers organic, artisanal and natural food products at affordable prices. All organic products, Swedish and foreign, are KRAV certified and meet the high standards of health, environment, taste and ethics. The business concept is to offer consumers a one-stop shopping store handling a mix of 75% organic products and 25% conventional products. About 150 small, local suppliers supply Retailer A and the retailer strives for 100% recycling of all food not sold to be sustainable in operations. A second store opened in early May 2016, also committed to provide a wide range of ecologically fresh organic products. The retailers also offers ready cooked deli foods and have a range of local organic wines and beers.

Retailer B
Retailer B is a family owned retail enterprise that started operations in August 2015 and is operated and by two people. It is located in the centre of Jönköping city. This retailer offers a deli concept with options for consumers to purchase take-away meals or buy 100% organic processed food products as well organic packaged gift baskets. Consumers have choices of products such as Swedish cheese, tea, and roasted coffee from the range of available product assortments. A variety of these products are gluten free and are not regularly available in larger stores. Small-scale local and foreign specialised grocery wholesalers and local producers supply different products such as cheese, tea and locally roasted coffee, which are some of their most selling organic products.

Retailer C
It is an organic grocery store in Jönköping, it sells food and hygiene products except meat. Started as a cooperative of 5-10 persons in 1989, the objective was to get access to OF because it was difficult to find. Now it has around 250 members represented by a board of a 5-10 representative that take decisions. There are around 40 suppliers and 5 of which are wholesalers. Local producers are used to supply some vegetables, fruits, grains and bread. Processed food often come from foreign countries. 50% of the products are imported especially in the winter mainly from Germany, Netherlands, Spain, Italy and France.

Supplier A
Supplier A operates as a wholesaler for organic food products. The supplier is based in Örebro and Malmö. Örebro is a suitable location for logistics due to its proximity to major cities such as; Malmö, 500 km; Oslo, 200 km; Stockholm, 300 km; and Gothenburg which is 300 km away. Supplier A focuses on premium products within the categories of organic, dairy, gluten free, natural and vegetarian. The company imports 98% of the organic products and local producers supply the remaining 2% of the products. The
supplier’s brand handles about 200 organic products plus 50 different other brands. The company has a turnover of 407 million SEK (2015) and has 40 employees.

Supplier B
This farm was established 790 years ago and has the oldest brand of cheese registered in Sweden. This is a proof of resilience and thus makes it an interesting participant. The farm converted to organic farming from 1999. The production which is KRAV certified consists of grains, milk and cheese. The production is performed in a hygienic high-quality way and with ethical considerations. The farm exports 40% of its cheese. The CEO thinks that the OFM will still grow because of the increased share of ethic driven customers and that it will offset the higher risks associated with organic farming. The high operational costs are compensated by subsidies and higher premium prices. Actually, there are risk of staying conventional because the profitability decreases due to competition that drives change to new markets. There are also threats regarding soil and the environment.

Supplier C
This farm is located close to Jönköping and is KRAV and EU-organic certified since it was started in 1992. It produces meat from 25 Charolais meat-race cows with calves and bulls. They are raised organically and grass-fed 100% which increases meat and fat quality, even if organic allows 30% of grains. The farmer believe that general organic meat production is low in Sweden because very few farmers are converting to organic farming practises. Indeed, there are difficulties to comply with regulations, because it would mean that the farmer could sell less quantity. There is also a lack of awareness among farmers due to their focus being majorlly on conventional farming practises even though there are organic education institutions now. The farmers are motivated to produce organic products through their own personal convictions. The interviewee thinks that organic and sustainable production is necessary for the future. Fertilizers and GMO not being a sustainable way of doing agriculture.

Ekoweb
Ekoweb provides a magazine, website, research and statistical reports about the OFM in Sweden. It is composed of 2 staff and was created more than 20 years ago. The reason why it is included in the interview is that the organization has an extended knowledge of the OFM in Sweden and the difficulties met by suppliers or retailers.

4.2. Risk assessment - Research question 1
Sourcing risks
Risks are common in organic business given the limited availability of locally produced organic products and the product features of perishability and short life cycles. These features make supply chains challenging to plan and manage since these products have a timeline within which their quality can be guaranteed before reaching the end consumers. There are insufficient supplies of locally produced organic food products and this creates a challenge of finding good reliable products at good prices.

“To find products that are organic is the biggest challenge” (Respondent).
Supplier A stated that even with the available local supplies, some suppliers bypass them to deliver products directly to retailers while others develop their own brands. Local supplier commitment is low given that they seek out the highest bidders for their products especially when supply is limited. This affects Supplier A’s margins and it is a risk the company cannot mitigate. Supplier A imports food from different foreign suppliers and a number of risks are encountered. Suppliers at times do not adequately check to ensure products are not infested or damaged. When products are delivered with problems, KM cannot fulfill local customers’ orders within a short lead-time. These delays are common, however if frequent it may mean a supplier is experiencing a problem that needs to be investigated.

“We received product shipment containing bottles with soft labels that were all destroyed. We got two trucks of 66 pallets amounting to 350,000 SEK. The supplier was helpful, KM sent everything back and the labels were replaced with new stronger labels and despatched back the shipment to us” (Supplier A.)

Communication is one of the biggest challenges because in case of any likely shortages in supply of certain products, a supplier may fail to provide notification in good time. Without the right information at the right time, it is challenging to procure a safety stock or seek for a different supply source. Some suppliers fail to communicate such critical information due to cultural or attitude contrasts influencing how business is operated. Events external to a firm’s SC cause disruptions.

Supplier A stated that “Sri Lanka has the most bank holidays in the world and this is where we import most coconut oil from.” “They celebrate Buddhist, Hinduist, Catholic Church and protestant church holidays.”

Suppliers may not provide timely notification since operations can shut down for weeks when workers at the supply base are away. Wrongly labelled products are a problem with imports and can affect the trust and relationships with customers. This can trigger a product recall, which is detrimental for a firm’s reputation.

Many processes and actors involved in food supply chains increase levels of complexity in operations. This compounds potential disruptions along the supply networks. A small retailer or supplier will always encounter risks as they seek to import food products else to take advantage of the growing organic market. All respondents in their respective firms highlighted stock outs of organic products during winter, a respondent indicated that they have to import 50% more processed products, which are supplied from Germany, Netherlands, Spain, Italy and France. This supports the argument that Sweden still experiences shortages in local organic production that is closely related to few farmers participating in organic farming. Organic food shortages occur due to short harvest seasons where harvest are limited. With food, product recalls are constant threat with potential of business disruptions and reputational damage. All respondents indicated that if any products are found to be non-organic, certifications could be revoked. Also, if hygiene or safety requirements are not maintained, that too, can cause customers to lose trust and confidence in products on offer. This affects the retailer’s image as well as its products’ image resulting in lost sales. Products losses occur due to
the short life cycle or quality anomalies, humidity control failure and absence of specialised packages needed to preserve product integrity.

Managing many foreign suppliers is challenging for small retailers yet imports are necessary to offset local food shortages. Without a good supply base, it is impossible to procure products that customers demand. A large supplier base may guarantee regular supply of products but this also result in inefficiency with increased operation costs.

**Production risks**

From 2008 to 2012, there was almost no organic growth and development in Sweden. Few farmers were interested in organic farming as it is both a capital and labour-intensive venture compared to conventional farming. Farmers preferred investing in conventional agriculture, which is associated with less risks and costs. Organic meat production is still low in Sweden due to the low conversion rates to organic farming. Organic regulations are difficult to comply with and the transition processes are costly and time consuming in which time, there is no production and earnings for farmers. However, some farmers are gradually taking advantage of the attractive market sales and though tend to sell to the highest bidders for their organic produce. Small-sized suppliers cannot compete with big established suppliers and have low bargaining power with individual farmers. This prompts these small and medium retailers to import products that they cannot find locally. Most businesses rely and depend on imports (Brat, 2015) to ensure availability of certain products. Respondents reasoned that low production is also a result of short harvest seasons in Sweden caused by annual to weather variations. This certainly increases operational costs and diminishes revenues.

Supplier A stated that agricultural equipment necessary for organic farming and production are expensive and scarce. Before any farmer is granted certification, he or she has to fully comply with organic requirements and regulations. Respondents cited how these are difficult to interpret and apply in practise. This may explain why farmers are reluctant to participate organic farming, a factor contributing to the low output. Soil fertility and environmental degradation are a threat as well as bad weather conditions, which affect farming activities and poses a risk of harvest failure. For those farmers that convert, production can declined due to long transition periods of conversion from conventional farming to organic. At times, some farmers revert back to conventional farming to make up for low production and lost sales incurred in organic farming.

Organic regulations forbid usage of antibiotics or medication for the livestock except when prescribed by a qualified veterinarian. Bugs and parasites are a threat and need close monitoring. Organic regulations inadvertently may be exposing farmers and their livestock or crops to disease outbreaks. This risk may be perhaps limiting efforts in more farm conversions to increase production. Respondents stressed the importance of abiding by the ethics and values in organic production. Any breach of regulations governing specific processes poses the biggest risk of reputational damage. This can affect affects both a firm’s image and brand. Long term, such a risk can affect relationships with supply chain partners. Supplier B mentioned that some customers purchase organic products on credit which they take long to pay back. Being small
enterprises, relationships with some customers are close in that personal interests may supersede business interests. This causes challenges in balancing accounting records.

There is also lack of awareness among farmers whose focus is mainly on conventional farming even though organic learning institutions are available. The grass-fed feature in livestock feeding is not well appreciated and recognised according the supplier B. In general, it is not easy to distinguish between organic and conventional food products except with the help of KRAV or EU certifications logos.

One respondent stated that “The boom in organics is not only in Sweden but also all over Europe but it takes three years for a farmer to convert from conventional to organic.”

Traceability is important especially when dealing with food. However, due to associated high costs this requires, all respondents agreed it is relevant but do not implement it. Their supply partners abroad do not implement traceability either due to associated costs. Technology solutions like Radio Frequency Identification Devices (RFID) are useful but respondents disclosed that their supplier partners locally and in other countries are small enterprises who cannot afford this. Lack of traceability makes it impossible to track food products at different nodes of the food supply chains. Since products are transported across extensive food networks, failure to trace products leaves a firm vulnerable to theft, damage or security risks.

Sustainability is the core of organic business, a factor confirmed by most respondents. However, Supplier A remarked “There are people who don’t think so much about sustainability, but do organic farming just of get money out of it”

To operate sustainably, all respondents disclosed they are working to improve packaging, recycling and minimising food wastage but it is a challenging business concept to implement. This is due to the many regulations governing sustainability that rightly emphasize striking a balance in protecting the environmental, economic and social aspects of business operations. Organic business requires a skilled workers competent enough in handling food products and interacting with customers. Unskilled and inexperienced staff cause damages and wastage when stock are mismanaged or operational procedures are misused. This is critical with product safety and security. Workers need to understand inventory management and also when to ship out first products with shorter lifecycles. Any breach of quality and safety standards can result in product recalls and sanctions as well as fines. This can contribute to poor customer service damaging company reputation as well the brand image. Reputational risk is difficult to mitigate as it affects everything a company stands for.

Product contamination is a major risk when the mandatory standards in preparation and storage are neglected. Organic regulations require every organic trader to have standard operations and risk control measures. If there is any negligence that causes safety concerns to the consumers, a certification can be revoked. Contamination can happen during production, transportation and packaging. In organic business, risks are unavoidable but it is the responsibility of firms to control or manage risks when these
occur. Importing from foreign supply locations limits importers visibility and control at the upstream of the food supply chains with regard to authenticity of the products. This is why some respondents would choose to work and procure organic products locally. This allows some sort of control and tracking where products are delivered from. Products with a short life cycle need close monitoring to ensure quality is sustained even during transportation and warehousing before delivery to customers.

**Warehousing risks**

Organic products require specialised storage with temperature controlled facilities to maintain product quality and safety. Supplier A mentioned that absence of these facilities or poor maintenance of such cooling facilities causes product damages and contamination. Skilled employees are a necessity to ensure proper management, handling and sorting of food. Failure to equip employees with the right equipment and technical knowledge creates a potentially hazardous workplace within a warehouse facility. If employees are not aware of safety and sanitation procedures, it may also create difficulties in handling perishable products with the shortest lifecycle to avoid wastage. Respondents in retail business pointed out that they do not have much warehouse space besides the storage rooms where extra stock are kept. The supplier respondents did have storage facilities whose size is determined by amount of product assortment handled.

**Demand risks**

Local market demand is higher than what is available in the market and this influences traders to import food products to cover for the shortages. Demand forecasts are difficult to target for certain products resulting in inaccurate quantities of product ordered. This affects sales and there are risks of stock-outs that create other problems. If products are sourced from foreign suppliers, a company can be out of stock for months. This makes it difficult to planning for promotional activities forcing firms into emergency procurements. These are costly and if not managed well, can lead to long lead time and strained supply chain relationships. Retailers prefer local procurement in such situations but local suppliers may not have capacity to fulfil orders. The food industry is competitive where the biggest food retailers monopolise food market. Small-sized enterprises cannot compete and will face difficulties challenging strong brands in big retailers market. These specialise in brands not commonly found on shelves of these big retailers. Stock outs are constant threat for all respondents due to limited local production, creating a dependency on imports. Farmers develop low commitment tendencies and prefer supplying products to big retail chains who pay more. Perishable products are difficult to manage due to the short life cycles. Forecasting demand for such products is challenging just as inventory management is problematic. Firms still strive to forecast to estimate and plan for consumer demand. Equipment failures (refrigeration and electricity supply) can damage perishable products and can be a potential source of disruptive risks. This threatens the ability of small enterprises to operate normally.

Fake products pose a threat as expressed by respondents. It is possible some farmers supply conventional products as organic using fake certification. There are no adequate measures in place to check this except with the certification. Retailers find it difficult to balance supply and demand to prevent stock outs and secure safety stocks. High transport charges are incurred when importing food products but this depends on where
good are sourced. Suppliers seek for product consolidation when delivering ordered products to save transportation costs and time. With organic food, product consolidation cross-contaminations are likely if implemented poorly. This can result costly in terms of lost sales. Failure to secure a good location with good customer traffic can influence sales and profitability of a business. Lack of access to a good transport network is key especially for receiving deliveries. Organic retailing requires substantial financial investments to realise any returns.

**Price risks**
The high prices of organic products is a deterrent factor for small retailers who have to compete for consumers with big established food chains. High food prices affect sales especially if consumers have alternatives to purchase conventional food. Big retailers easily offer price discounts to attract customers but small-sized firms may not regularly sell on discounts according to one retail respondent. Fraud in the food industry is a possibility as most traders seek to gain from attractive market sales and high consumer demand. Respondents emphasized that scrutinizing organic certification of supply chain partners is a preventive measure but this only cannot prevent sale of fake organic food on the market. Customers may also see no compelling or convincing reason to purchase organic food if they can buy quality conventionally produced food. This certainly affects sales for small-scale firms because purchase decisions will solely depend on customers’ decisions. There is still a lack of awareness of the health benefits of organic food products since it is difficult to convince consumers to buy expensive organic products over same quality but cheaper conventional products.

**Financial risks**
Constant changes in rates of currency affects imports when procuring products from countries where there are fiscal problems like interest rates fluctuations. When this occurs, firms are forced to sell imported products at cheaper prices below what they spent on importing. All respondents confirmed importing some organic food products. This risk is known to likely happen at any time. Economic situations in different countries can suddenly change and affect availability of some products or prices at which such products will be sold. Organic farming being capital and labour intensive, small sized enterprises may find it difficult to obtain credit without being credit worthy with no collateral backing.

**Institutional risks**
A change in policies such as organic regulations and certification requirements may create production restrictions with a change in application of such policies. Stringent animal welfare policies, changes in rates of subsidy contributions, changes in taxation and credit policies will only make it tougher for small and medium sized enterprises to profitably engage in organic production. From all respondents, the current prevailing organic regulations are already seen as complex and are difficult to follow and apply. Since all respondents accepted that they import organics, if food regulations are altered for any unforeseen reason, levels of imports can be affected and this is a threat these small-sized enterprises are wary of. When these changes occur, these may lead to more farmers abandoning organic farming and turning to conventional farming which is viewed as less risky. Countries where imports are sourced from may change regulations.
to protect home markets and thereby restricting how much can be exported. Policy changes have an impact on how organic production will develop to attract more farmers who can increase production levels or ensure imports are not destabilised.

4.3. Risk mitigation – Research question 2

Production procedures
At supplier B, cheese and milk production are performed in a hygienic high-quality (within acceptable standards) and ethical procedures. Some methods like HACCP can be used as tools to structure the production processes. To reduce cultivation risks, supplier B uses techniques such as management of the time of seeding and crop rotation. For supplier C, it is mainly about taking care of the cattle, for example when the cows are about to give birth, the barn is checked every 4 hours to prevent the calf staying in the middle of the barn that could be dangerous for its health as the place may be unhygienic. Retailer A also follows the HACCP protocol, it is inspected by the health and environment safety authorities. It has a crisis management and an environment policy, which is embodied by investments in sustainable energy or other equipment. At B, measures such as humidity control and special packages are used to preserve product integrity. Supplier A uses HACCP on every part of operation to mitigate risks. It is key when working with food and supplier A checks with suppliers to ensure they have a system like that as well. Supplier A requires that every supplier has HACCP operational and checks to establish that it being used or not. HACCP is a requirement from the food industry and the regulation to sell organic products. The Swedish government authorities control that food actors in the organic sector have this control measure. HACCP is useful for supplier A especially when operations became complex.

CAP
According to supplier B, the CAP is not much of benefit to farmers but is of greater benefit to the big established organic processors. Indeed, these entities adapt their buying prices to agricultural subsidies so eventually the farmer get the same margin, cheap prices allow them to export and be competitive compared to firms from other continents. A free market food economy would be more suitable compared to the CAP as it has lost its relevancy for especially small-scale farmers.

Supply chain flexibility
At supplier B, if there is a surplus with a good selling price, productivity can be increased. If this surplus has low selling prices, costs must be reduced. For B, the main challenge comes with the negotiation of the lot size that are usually too high for the low volumes sold. Retailer B specializes in organic products with longer shelf life which enables flexibility in customer service provision. At supplier A, some products have two weeks of security stock, for coconut products there are eight weeks. The amount stored depends if such shortages are happening once in a while or often. Supplier A will contract another supplier if supplies are constantly delayed. Multimodal transport is used. For example, imports from Germany are transported in containers on trains and are transferred to trucks once these arrive in Sweden, which are then delivered to supplier A rented warehouse. This is helpful since products are not repacked and minimizes handling of products that may result in damages or loss. It offsets risks such as contamination, high cost of transportation, damages to the products.
Supply chain visibility
To control the quality of the product, retailer C asks for the certification and can visit its suppliers. For retailer B, some suppliers are also inspected to ensure organic certifications are up to standard. Meanwhile, there have not been any problems with the certification of Swedish producers that the retailer works with. There is trust in products and services suppliers provide. The retailer endeavors as much as possible to confirm the authenticity (quality) of organic products from suppliers.

“This is the reason for us choosing to work more with local suppliers so that we can have a better grip of the quality and better insurances” (Business owner).

Retailer A tries to source in the surroundings. There are no problems for sourcing. The suppliers are controlled by visits or certification inspection; if one does not comply, he/she would be discontinued from supplying any products. At supplier A, samples of products to be supplied are checked and analyzed to ensure authenticity and quality. The production is also controlled. There is a document that suppliers fill out from supplier A, they sign that and includes the code of conduct. There is a packing agreement that the suppliers have to sign and supplier A also rely on the control organization that has checked them. Supplier A has an updated certificate every year which shows that it covers the product bought and then KRAV comes here to check that the documentation is present.

Certification
For supplier B, Some KRAV and EU organic rules are difficult to implement but are worth the effort. Indeed, the organic movement started with ideological not practical measures. The products could also be entitled to protected labels but it would not bring much to the reputation because the farm already has a long history and recognized brands. For supplier C, the KRAV certification is more demanding than the EU certification. The farm is checked and inspected once a year by Hushållningssällskapet, which certifies on the behalf of KRAV and EU-organic. The compliance with all the rules is not a big problem because the farm has decades of experience. Other organizations that provide information, checklists and best practices for farmers are Miljöhusesyn and the Farmer union LRF. For retailer A, the KRAV standards are easy to comply with, however the compliance with regulations and the issue of product perishability require skilled employees. For B, it is easy to comply with the standards; the shop is controlled by KIWA, which is a KRAV representative. For retailer B, products can be KRAV or EU label certified. This is reason why the retailer does not handle conventional products even though there are many quality non-certified products out there in the market. For Ekoweb, there is a need to increase the awareness of the advantages of the organic products. For supplier A, the common EU certification is especially useful, the respondent said that “before the EU label, most of the certification bodies had something different here and there, making it very difficult to get products certified under KRAV. So you really needed KRAV to be accepted in Sweden”.

KRAV inspects the company every year, they come for a day or two and they check and analyze product content. KRAV needs to see how much supplier A have bought and sold so that in total, there is no more sales than what has been bought. Otherwise, it would mean that there has been some cheating. There is much paperwork handled because
supplier A has to ensure that its suppliers have the right certifications, it also has them for inspection. Everything that is imported from outside EU has a special document for that which has to be signed by customs. This is checked to ensure products imported and regulations are complied with. Supplier A has to have that document sent from customs for KRAV inspections. This is for both EU and KRAV. The certification process is more expensive on one hand but it also re-assures consumers that organic products sold to them are of good quality and safe. This is very important for sales; of being expensive but supplier A sales are good because of the KRAV label. The revenue margins help offset some of the financial expenses accrued in such processes.

**Diversification of retail channels**
The channels of distribution of supplier B are specialized cheese stores, restaurants and wholesalers for restaurants. For supplier C, the main part of the production is sold to the slaughterhouses. The farm tries to sell meat to local retailers of the closest village and local restaurants. The other channel is direct sales to customers online via http://www.brunnhultsgard.se/. 25 kgs meat boxes of a variety of parts can be purchased 2 times a year on demand - 165kr/kg. Possibility to visit the farm. Last year for the first time, the farm sold 15 meat boxes to families or restaurants. For the farmer, the profitability is higher and there is a direct contact with consumers. For these reasons, the farmer will try to develop this kind of distribution. For retailer B, customers can order for organic products online through one of the wholesalers. The wholesalers or producers handle all payments when customers order for products, transportation, delivery and the retailer is a pick-up location. This is an aspect of online purchases for customers who may not purchase products that the retailer already has among the assortment of organic products on shelves. When customers pick up their orders, possibly they end up purchasing something else. Online social networks are used for marketing to build up the brand image of the retailer.

The retail owner disclosed the need for “investments in developing cooperation with corporate companies to provide take-away and catering services where we could sell lunch packages for conferences and meetings”.

The retailer has premium gift packages comprised of chocolates, olive oil and pasta. These are sold most during festive periods annually. This is a potential area for high sales to develop. Supplier A sells organic products to retailers such as Coop, Axfood, ICA warehouses or stores. Supplier A can also sell directly to the shops if the transaction reaches a certain amount. Supplier A also sells to wholesalers who provide food service. Products are shipped free when customers make purchases for a certain amount of money. Additionally, since many schools and hospitals have now changed to organic consumption, supplier A is trying to provide products at a good price, allergies-free, BPA-free, and the at right lot size. Indeed, “some traders offer only 10 kg packages but some schools may want 5 kg packages, supplier A maybe the only suppliers of such smaller packages”

**Brand image building**
At supplier B, the set-up and history of the farm contribute to the unique taste and appearance of the cheeses sold. The channels of distribution ensure that the product brand image is improved in the marketplace. The emphasis is put on the specificity of
this high-quality cheese, which can be sold to local restaurants but not to the big retailers that are too generalized to know the specificities of the cheese. The farm has public events where kindergartens, schools and the public are invited at the farm. These events act as a promotion to increase awareness of farm brand image. Generally, the prices are kept up to preserve brand image and prevent reselling by general retailers. Finally, the integration of the production and the associated quality act as an argument for customers for credibility and higher price. Regarding B, customers ask for organic but also local production and Fairtrade. The offer of food is adapted to the season and the shop tries to limit airplane transportation. According to E, consumers also ask for close production, good conditions of culture, certified product origin, less sugar, organic packaging. At supplier C, the animals are grass-fed, which means a higher quality for the meat and fat. Unfortunately, this feature is not well appreciated and recognized and ways should be found to increase this awareness. To further increase the meat quality, it is possible to use a mobile slaughterhouse. It reduces stress for the animals because they do not have to be transported and wait for a long time. For retailer A, the store adapts to the demand by changing the range of products. The products are selected according to their quality. In addition, the suppliers can come in the store to talk with customers and explain the story behind their products. Retailer B specializes in bringing in OF products that are not readily available in the big supermarkets with just some few exceptions.

According to the owner, "we have a lot of local producers that do not supply or sell to the big retail chains and we, in the retail shop offer more value added personal services for customers who want the opportunity of tasting products before they purchase whatever they want".

The retail outlet will launch a test run with "after-work". "This will involve customers being offered options to consume well-chosen OF with low-alcohol drinks". All packed products in the retail shop are KRAV or EU certified to provide quality assurance for customers. The business owners work mainly with wholesalers that specialize in OF such as a Gothenburg based wholesaler called Dagcimeja. The owner further declared "We have a list of local and foreign wholesalers on our website who supply a mix of local and foreign refined organic products respectively".

Regarding supplier A, the company identified a niche market and focused on products that were not readily available in the market. It has gone from being a wholesaler to a company selling brands. The participant declared that "If such a brand is strong enough and most people associate even people that don’t buy organic that supplier A is organic, then you have a strong brand and you are allowed to be in the shelves". To try to prevent the bypassing from the retailers from happening, supplier A continuously works to strengthen its product brands. Indeed, "When you have a brand so strong, you command shelf space in shops or supermarkets. Supplier A desires to have its products on shelves of shops." To strengthen its brands and its visibility, supplier A works with shops to offer special offers (discounts), product demonstration and tastings. The company maintains a good presence on social media; there is a staff working fulltime on that. Supplier A also supports some television programs, which many people get to watch, and here supplier A has its brands displayed on shelves or used in cooking shows. This helps improve consumer awareness of supplier A products. Supplier A’s brands
image in the market stands at about 60%. In addition, sustainability is very important and is emphasized in some projects. Supplier A is working to improve packaging, recycling but it is quite a challenging business aspect to implement. Some organic products supplier A buys are purchased in 25 kg bags and shops are free to buy these quantities from supplier A.

**Horizontal and vertical cooperation**
Supplier B delivers 80% of its milk production to a cooperative. The upstream supply chain is integrated to reduce costs and ensure quality: the fodder is internally produced at 85%, the milk wholly comes from the farm. Integration also diversifies the activity, which helps mitigate market risks and integrate added value in the chain. This also allows easier experimentation. One cooperative is used but it provides least interest for farmers. The main advantage is that it buys all produced milk, but at a set price. This price should reflect real market economy because it could lead to overproduction. Business partners are used to reduce or mitigate risks but this is performed without a formalized risk management strategy. For instance, they provide contacts and fairs participation. Supplier C also produce its own fodder that is fed to the animals. According to Ekoweb, some retailers engage to buy the production of the farm that is in conversion at a higher price. It allows the farm to be financially profitable and the retailer to have a secured source of supply. According to supplier A, the network of suppliers is really strong, reliable and the relationships are good too. Supplier A does not collaborate horizontally with other wholesalers to manage supply risks in Sweden but collaborate with some wholesalers in Netherlands to ensure supplier A is supplied more volume of products contracted for delivery. If supplier A cannot help with a request from new suppliers, they will collaborate with other wholesalers who may want to handle and work with such brands.

**Supplier-buyer relationships**
At supplier B, the credit risk is reduced by checking and personal confidence in products. The farm can ask for advance payments but it can depend on specific country market situation where products are exported. Sales on credit are accepted in Italy and France but not well appreciated in Sweden. During the first sale, payment in advance can be requested and if confidence and trust of a consumer is established, longer payment terms can be discussed. For retailer A, the relationships with the suppliers are good, the meetings and open discussions promote mutual trust. The retail owner of retailer B provided an example where “products like chips have a shelf life of 3-6 months but if these are delivered and have only a half of the shelf life left, it’s still okay but we don’t want to pay fully for it”. “We need to have that kind of control mechanism to ensure that we get what we pay for”. It is beneficial to directly source for several products from a single supplier other than sourcing from multiple suppliers, which limits efficiency in terms of product quality, costs and lead-times. The retailer adds “a wholesaler able to supply a number of products we need could be a better alternative but there are not that many like that locally”. The number one criteria for supplier selection is the quality of organic products a supplier has and additionally, if they have a passion for OF which is a great plus. Some suppliers are contacted during a trade fair or contacted when the retailer has heard about their products. The suppliers provide some samples with a couple of questions when they (suppliers) establish channels of communication with the
retailers. The retailer will purchase these products if they are interested. This also requires much effort to manage and sustain many supplier relationships. Supplier relations is a major issue to develop and maintain. The retailer used personal working experience to develop supplier relationships so it was from there that suppliers were identified and contacted to start supplying organic products.

At supplier A, communication with retailers is important to manage the disruptions that can happen. Indeed, the retailer must have its shelves full and supplier A should be able to provide a lead-time for the next shipment or a product of substitution. With the high demand for OF, it is always safe to contract supplies in advance so as not to run of stock. Advance payments help provide assurance to suppliers to influence them to ensure product availability to respond to market demands. Some wholesalers that supplier A deals with implement eco-social projects, where some farmers are involved. They have a direct connection and are provided a guarantee that they are paid in advance. The farmers find it difficult to sell to someone else. “There are eco-social projects implemented in China hence KRAV certified imports from such a location are possible”.

The relationship should be that when you work with a supplier and you are a main customer to him/her, he or she should also be interested in informing you what is happening in the market. Supplier A used to import millet form China but now imports this from Poland. Supplier A tries to source products from nearby suppliers if possible. Price, quality, easy of checking on social standards, reduced food mileage (reduced transport costs) influence decisions to change suppliers or supply sources. Finally, supplier A can secure an exchange rate depending on based on the local currency of the country a supplier is based in.
5. Analysis

In this chapter, the findings are analysed and compared to the literature. The objective is to provide answers to the purpose.

5.1. Risk assessment – Research question 1

Sourcing risks

In general, all respondents mentioned the challenge of low production of local organic food products (KRAV, 2016) and affirmed that they all import organic food products due to these shortages (Ranninger, 2014). For small retailers and suppliers, low production implies constant competition with the big retailers for the limited available local products. With imports, food traders have to deal with high transport costs, high prices of organic products, safety and regulatory requirements (Ades et al., 2012). The problem of insufficient quantities of locally produced organic food was made clear by Supplier A who mentioned that "to find products that are organic is the biggest challenge". Trade regulations differ in several countries and can change over time and become harder to comply with, resulting in delayed delivery of imported products.

Suppliers and retailers not only face unreliable local supplies but also have to contend with threats and potential risks at their respective foreign sourcing bases. These risks include Supplier bankruptcy, quality issues, capacity shortages or even suppliers engaging in illegal practices such as child labour (Chopra & Sodhi, 2004). These factors cause serious challenges in managing food chains and respondents expressed these as among their major concerns with foreign suppliers. In addition, perishable products with short life cycles require specialised transportation and storage cooling facilities that increase operational costs and uncertainties. Uncertainties arise from failure to ensure proper temperature controls during transportation and storage from producer to end consumers. This compromises product quality and safety and can result in damages and contamination. This has financial implications in terms of losses for parties involved. Retailer respondents operating deli concepts iterated the challenge of sustaining quality of food to ensure customers purchase safe and fresh food.

Supplier B cited a communication challenges that reveal the magnitude of collaboration problems along supply chains that only make risk management a daunting task. Suppliers in foreign bases may misinterpret orders resulting in dispatch of wrong consignment of products and delay will ensue. Lack of collaboration affects timely dissemination of critical information across food networks to prevent stock-outs, which every respondent revealed as a major concern. When delivery constraints and product problems occur or incorrect information exchanged (Sanchez-Rodrigues, Potter, & Naim, 2010), suppliers and retailers are left dealing delays resulting in failure to fulfil customer orders which can affect trust. Respondents also highlighted the importance of traceability (Elmsalmi & Hachicha, 2013) given the complex food supply networks they operate in, involving more than one tier of suppliers. However, respondents traceability is costly to implement since most if not all supply chain members are small-scale without financial capability to install traceability solutions such as Radio Frequency Identification (RFID). Traceability and transparency are a necessity in today’s food networks and a lack of either exposes firms to serious unethical supply chain practises. These practices include non-compliance with organic regulations, breach of contracts...
(Ruben et al., 2007) and pilferage causing business losses. The failure to use traceability also leaves food supply chain vulnerable and firms appearing to lack accountability in cases of emergence of a safety issue requiring a product recall. Without traceability, stakeholders may struggle to identify vulnerable nodes along their supply chains to enable faster decision making to manage fraud, recalls or contaminations when these emerge. Supplier relationships are key for food importers but retailer respondents mentioned challenges in managing and coordinating these relationships. For Swedish importers, global sourcing increases risks in procurement from such factors as labour strikes, complex transport routes, longer delivery periods, larger in-transit stocks and unreliable supply schedules. Respondents emphasized the strain of multiple suppliers on their procurement processes resulting in high levels of complexity. The failure to manage these relationships complicates efforts to ensure supply of a variety of products and single sourcing has its dangers of price escalation, supply disruptions and dependency.

**Production risks**

There are production risks evidently illustrated by the prevailing inadequate levels of organic food supply in the Swedish market. Suppliers B and C attributed the low organic production levels to few farms being converted for organic production due to associated risks. The low conversion rates are attributed to organic farming being both a capital and labour intensive venture, requiring substantial investments and is a time consuming form of farming. Most farmers will probably find it safer to focus on conventional farming where there are fewer risks and hence organic production remains inadequate. Supplier A mentioned a lack of awareness among farmers of the available organic institutions, which might be attributed to a lack of conviction in the merits of organic production given the associated risks. Supplier A remarked that “it takes about three years for a farmer to convert from conventional to organic farming.”

The above statement underlines the reality that for a farmer or supplier to harvest the first yields, a lot of investments and time have to be committed to develop production and certification processes. During the transition period, there is no production and a supplier or retailer cannot distribute or sell any products. Generally, respondents noted that production drastically declines during conversion periods. Supplier B reported that some farmers actually revert to conventional farming to try to make up for lost sales and revenues incurred in organic farming. Even after gaining certification status, respondents reported that organic regulations are complex to understand and apply in practice. Specific equipment required for organic farming or production are expensive or difficult to access especially for small-sized enterprises. When production or harvest is finally commenced, supplier C claimed some farmers hoard their produce well knowing that there is a high demand. It is noted that some farmers contracted to supply big retail chains have a low commitment to who they sell their products to, instead they try to sell to the highest bidders. As a result, there is an intense competition for some of the scarce locally produced organic foods. Since local production does not meet market demand, suppliers and retailers resort to importing organic food products to meet the market demand.

There are environmental related risks such as soil fertility degradation and bad weather conditions (Leat & Revoredo-Giha, 2013) reported by supplier B and C that affect farming activities and threaten harvests. Organic farming regulations prohibit the use of
medication, antibiotics or pesticides, which may leave livestock or crops vulnerable to disease outbreaks (Leat & Revoredo-Giha, 2013). Supplier B reported bugs and parasites (Nyamah et al., 2014) as a regular occurrence and a threat in livestock, requiring close monitoring especially during winter. Given the high demand and attractive product prices, there are risks of fraud and unethical practises by some opportunistic traders trying to sell non-organic food as organic. Any abuse of values or ethics governing organic production can erode consumer trust and confidence. This has a detrimental effect on supply chain relationships depending on what has happened. For consumers, unethical practises such as mislabelling products for economic gain might cause a lot of mistrust for retailers or suppliers concerned. Such a situation can damage a firm’s reputation, which is according to supplier C, possibly the biggest risk any business may face. This is because a reputational risk can cost a firm valued relationships and is difficult to manage as it could involve sanctions and fines. Failure to recruit competent workers can affect production procedures if operational standards are not adhered to. Product damages or contaminations may occur due to accidental mishandling of equipment or misinterpretation of guidelines. This is particularly critical because of the perishable nature of organic products with short life cycles.

Respondents acknowledged the benefits of traceability for tracking the path of food products, ensuring safety from farms up to the end-consumers. However, none of the firms implement traceability citing the high costs of implementation and this endangers their food supply chain should there be a problem at a given node. When a risk situation occurs in an extensive supply network, supply chain partners may find it difficult to identify the exact source of a risk or establish a supply chain area affected. Risk mitigation becomes difficult to implement since supply chain members cannot pinpoint a problem fast enough.

**Warehousing risks**

Perishable organic products compel firms to have specialised transportation, storage, and distribution facilities (Srivastava, Chaudhuri, & Srivastava, 2015). This necessitates firms to have substantial investments to sustain operation of these facilities for which small enterprises may not readily manage. With the increased organic imports moved along extensive food networks, there are potential risks in failure to maintain the right temperature controls (Raab, et al., 2008). This may be difficult for local market traders since they do not have absolute control of actions of every chain member at the upstream of the supply chain. Complex logistic processes (Grievink et al., 2002) may prove to be challenging for firms to ensure product quality and safety from its origin to the end-consumers. Failure to train employees to enhance their awareness in how to position products, separate food (allergens from non-allergens) and maintain good hygiene may result in non-compliance with food safety guidelines. Product losses or contamination (Bogataj et al., 2005) are inevitable in such situation. Negligence in standard operation procedures may result in failure to dispatch the correct products. The need for specialised temperature controlled storage and transportation (Raab, et al., 2008) may be costly for small-sized enterprises to implement and sustain in the long term. The use of service providers to resolve this may imply loss of control for firms of that aspect within their supply chains. A lack of a comprehensive food safety plan could render warehouse operations vulnerable to incidents of fire (Axfood, 2016), cross-contaminations and missed opportunities to maximise operation outcomes.
**Demand risks**

The insufficient levels of organic food production (KRAV, 2015) makes forecasting demand a challenge for firms attempting to balance supply and demand. High consumer demand has caused supply constraints partly due to production shortages (Brat, 2015). Stock outs are a constant threat making demand planning difficult to estimate and plan for (Chopra and Sodhi, 2004). Local producers cannot supply adequate supplies and with imports, there are long lead times which makes challenging to plan. Economic changes or consumer demand variations (Tang, 2006) can affect a firm’s ability to forecast future demand for specific products and securing safety stock. Delays occur during transit especially with imports (Sanchez-Rodrigues et al., 2010) or orders being misinterpreted resulting in wrong quantities dispatched. Any sort of delays in receiving procured food may mean a firm cannot provide timely customer service. Organic products are perishable and require care and urgency in handling and storage (Srivastava et al., 2015). Managing inventory for such products is a challenge since cooling facilities must be fully functional with well-maintained refrigeration to sustain product quality. Product losses and lost sales are a constant threat firms contend with if there is a failure of the cooling systems to preserve quality and integrity of products. Consumers’ interest in affected brands can decline if there is a health concern and a product recall is initiated. Respondents expressed hazards of a food recall (Vorst & Jack, 2005) which may suggest a failure to maintain product safety standards. Market reports about a recall or safety concerns (Oke & Gopalakrishnan, 2009) affect a firm’s reputation and relationships with customers and regulators. Operations maybe interrupted if a recall is causing serious health or safety risks to consumers’ wellbeing.

Research respondents revealed that competition from big retailers with their strong brands is a threat to their firms. Some farmers also prioritise supplying big retailers to earn more for their produce. This shows the challenges of having control of end-to-end supply chain visibility, which small firms cannot establish. High transport and commodity prices of imports diminish efficiently of firms. Respondents pointed out the risk of possible fraud in food imports (KRAV, 2016). With high demand for organic food, respondents disclosed there maybe unscrupulous traders mislabelling and counterfeiting non-organic food for economic gain. Fraud is a serious risk occurring possibly due to complex food supply networks (Sheffi & Rice, 2005) and food itself being a global commodity. Some suppliers will probably try to take advantage of challenging visibility to commit fraud. Retailers B and A mentioned challenges faced in managing many supplier relationships. The failure to nurture and sustain these relationships is detrimental to firms with ambitions of gaining market share and sustain wider supply chain performances. Firms will continue to rely on imported produce for the unforeseeable future and competition for customers and scarce food resources will increase and remain a constant threaten.

**Price risk**

Organic production can only return yields after the transition period is complete and that is 2 to 3 years (KRAV, 2016). During this transition period, no production is realised but resources are spent on production processes, equipment and labour (Leat & Revoredo-Giha, 2013). This slow process does not guarantee reliable supply of products. Market prices are dictated by availability of products, irregular supply causes a hike in cost of
food products (Tangermann, 2011) and excess supply may see a reduction in commodity prices. High financial costs and long transition periods deter conversion of more farms for organic production and this too contributes to low supplies (KRAV, 2015). The short harvesting season for food crops does limit levels of available organic food during off seasons. A respondent in food retail mentioned that despite the consumer demand for organic food, some consumers prefer buying conventional food seen as equally healthy and cheaper.

Prices on the local market may be influenced by events where firms procure their food imports. Political instability at supply sources may create uncertainty in markets firms purchase food produce. There may be challenges in shipping out products as transport or distribution networks are disrupted by civil unrest because of political uprisings. Unreliable product supply will eventually result in price fluctuations and increased levels of uncertainty. Significant changes in consumers’ preferences or patterns and actions of competitors who may engage in price wars can negatively influence how firms sell their commodities. Economic downturns and fluctuating commodity prices at supply bases may increase operational costs which firms will try passing on to consumers.

Financial risk
Food imports are increasing in volumes on the Swedish market (Ekoweb, 2015) and firms encounter currency fluctuations challenges as they access food products in different countries. Interest rates will fluctuate (Leat & Revoredo-Giha, 2013) and these differs from country to country. This influences how small firms deal with costs of commodities or services provided by suppliers in different countries. Respondents from firms importing from Asia mentioned that they encounter interest rate fluctuations that affect prices of commodities, which are usually high. This will also influence prices at which products are sold on the local market. Obtaining credit from financial institutions may be difficult for small-sized enterprises given their limited collateral security. This is slowing down business expansion efforts according to one research respondent. The lack of financial power may also affect development of relationships with other firms such as service providers who will need to establish if a partner firm is financially capable of sustaining operations.

Institutional risks
Regulations are enacted to protect all parties involved in organic business and these can change at any time (Leat & Revoredo-Giha, 2013). All respondents acknowledged the benefits of these organic regulations, which help to check fraudulent practises (Deep & Dani, 2009) that can endanger consumers or cause environmental degradation (Nyamah et al., 2014). Research respondents thought organic regulations are too complex and difficult to apply. Any changes in such regulations could either affect production levels or influence increase in farm conversions, which will definitely improve availability of locally, produced or processed products. The difficulty in application of organic guidelines also affects how firms import food. If regulations in other countries restrict export of certain food products that may be in short supply, that could create a shortage on the local market. Countries may want to protect their own food markets from foreign competitors to secure domestic supplies. Safety is essential when working with food and failure to apply industry standards to ensure food quality can cause reputational damage
for concerned firms. Additionally, when policies fail to enforce safe practises during production or importation of food, fake products or abuse of standard production procedures could occur. Consumers’ trust could be affected if regulations cannot check sale of fake products. Firms will not be able to provide consumers assurances of the authenticity and quality of products sold. A change in taxation could affect margin returns that firms earn and can limit their competitiveness given the dominance of the food industry by big retail chains.

5.2. Risk mitigation – Research question 2

Production procedures

Food and organic products require specific methods and procedures to reduce risks associated with production. Some techniques described by the FIBL (2016) are used to counter risk. The use of comprehensive tools such as HACCP, or specific organic techniques that could be difficult to find or more expensive, is key to control production variations and structure the processes. The hazard analysis critical control points (HACCP) method establishes procedures in the food industry whereby hazards can be reduced or eliminated (Egan et al., 2007). The rigidity that is brought to the supply chain by these methods are offset by a regularity of demand due to an increased trust and less cases of contamination or quality defaults.

CAP

It is difficult in a disaster-free context to estimate the real impact of the CAP on the farmers. On one hand, the high share of the direct payments in the net revenue of farmers (European Commission, 2013) and the green component of the CAP provide revenues for organic farmers. On the other hand, the CAP seems to indirectly profit to the processors or the retailers, since they adapt their buying price, which eventually makes the margin of the farmer the same as without the CAP. This last point is in line with the accusation of unfair competition as reported by Bourgeois (2008).

Supply chain flexibility

The organic producers not being as many as the conventional, the risks associated with being out of stock and supply sources is higher. The findings confirm that incorporating flexibility in an OFSC increases operational efficiency, as described by Sheffi & Rice (2005) Companies thus implement security stocks or contracts. Challenges come for small retailers with the lot size, meaning that they have to negotiate or find other activities to justify a higher price. Finally, the choice of a flexible mode of transportation is important to overcome long lead times due to disruptions, these means should also be chosen according to their capacity to deliver small packages and minimize handlings. As described by Chopra & Sodhi (2004), these flexibility tools enable firms to adapt to new situation and manage products with short shelf life.

Supply chain visibility

The most used ways to ensure visibility are visits of the suppliers and as requested by the European Commission (2007), the collection of the certifying documents. Indeed, as described by Roth et al., (2008), the producers and retailers are aware of the concerns that could emerge from a product contamination. The factors that increase visibility are local suppliers, good relationships, existence of agreements between partners and
collaboration within a network. Visibility is especially important in the OFM since the customers buy the product but also a quality and a story, this is in line with Susan (2012), who suggests that visibility is key to ensure consumers' confidence.

**Certification**

The overall results show that certification is seen as an advantage and a value-added component for the actors. Indeed, the more a product is certified by different labels, the more the consumer will trust the organic content. The compliance with the legislation like the European Union Regulation 834/2007 (2007) or the Swedish one (KRAV, 2015) does not seem to create problems for production thanks to the use of techniques and experience. In that sense the organic certification seems to be not as problematic as described by IFOAM EU Group (2014). The results have shown that the majority of actors started organic production because of personal convictions. Considering this and the fact that the producer, processors and retailers are checked by different official organism, and also that the medias bring pressure on them as it has been seen in a false accusation of cheating, it is unlikely that a consumer will find a product labelled organic that is qualitatively not organic. In that sense, it can be said that the certification fulfills its role as defined by European Union Regulation No 834/2007 (2007). Generally, the organic certification makes the OFSCs in Sweden quite reliable when it comes to the authenticity and traceability of the products. Besides these advantages, the certification process costs and represents a share in the price paid by the consumer, which is in line with the high certification cost described by KRAV (2015). Some marketing campaign should be launched to inform the public about the advantages of organic products since in some cases like chicken it is not clear. However, to convince customers to buy organic foods is difficult according to some of the respondents. Indeed, health issues can trigger the switch from conventional to organic.

**Diversification of retail channels**

This new mitigation category has emerged from the findings. There is a great advantage of diversifying the channels of distribution to reduce the demand risk described by Diabat et al., (2012). It reduces the risks that could happen to one particular channel and it allows access to more customer. It is especially important in the OFM since the wholesalers and retailers could be at threat from the already established ones that possess an extensive network and efficient supply chain. Thus, finding new ways to reach customers allow the actors to focus on markets that are suitable and sustainable. For example, the local aspect of the supplies, the direct contact between suppliers and customers and the access to some niche markets like public schools or work councils have been found to bring in customers. This type of customers ask for quality food with high traceability, something that the dominant retailers or wholesalers cannot provide easily. This direct relationship between producers and consumers is close to the CSA model as described by Henderson and Feagan (2008). Online sales that are accompanied with a social presentation promoting health, local production and quality of production is used to get closer to customers.

**Brand image building**

This aspect, that has turned out to be one of the most important to reduce risks associated with price and demand, has emerged from the findings. Indeed, the brand determines
why a higher price is justified, as in the case of supplier B and supplier A. Customers will pay more if they know they can trust the brand and if the quality standards are high. To associate any quality or high-priced product and organic seems to be profitable. As reported by supplier B, with high priced products the share of the organic content decreases anyway so it is not a big risk. Susan (2012) increasingly considers the health and environmental aspects considered, as consumers are aware of the different scandals associated with conventional agriculture. Thus, a high-reputation product conventionally produced that would claim to be of high quality would be in competition with an organic yet low-reputation product. This could be interpreted as a shift of the definition of value for food products from external aspects of high-price, selective distribution and marketing to internal aspects of certified quality and conditions of production.

To improve the brand image, a firm can enhance the quality and go beyond organic standards defined by KRAV (2015), starting from the animals’ fodder, the way they are slaughtered to the extra controls performed by the wholesaler. It can also focus on the channels of distribution to make a product rare and to sell it only through specialized retailers that are able to recognize the intrinsic value of the product. The marketing value is also important and is built by communication that promote the healthy and environmental-friendly aspects, whether it is by online media or TV shows.

**Horizontal and vertical cooperation**

The findings reveal a vertical integration by producers but limited to the upstream part of the supply chain. This is used as a way to promote innovation by free experimentation, control of the quality of the products, marketing advantage and retention of the value chain. It is also used to secure the supply sources since the OFM is nowadays in Sweden more characterized by underproduction than overproduction. In addition, one supplier used information sharing as described by Simatupang et al. (2002) to communicate future sales. Horizontal cooperation is used but limited to a part of the production or for business relations. For example, cooperative are used and according the three types defined by Ortmann and King (2007), the marketing one is mainly used for production selling. It is a way to increase confidence between actors, information sharing of contacts and a secured outlet to sell the production.

**Supplier-buyer relationships**

As suggested by Lee et al. (1997) and Naspetti et al., (2011), this aspect has been found to offset a variety of risks. Good relations enables actors to exchange information, resolve crisis such as disruptions, secure the payments and foster cooperation. The selection of suppliers was made from criteria such as quality, price, personal experience, distance and passion for OF. To reduce risks associated with a new supplier, companies can rely on the expertise of their network and they can analyse the products to be sure that quality standards are respected. In case of a new customer, its brand image and ability to make payment in advance are important to develop a good relation. In the framework of Cox (2001), the power regime is deemed as buyer-supplier interdependence since availability of some organic products is limited, however the relation is evolving to a buyer dominance like in the rest of food retailing because the offer of supply is rising worldwide and harmonization of legislation as well as eco-social projects make imports easier.
5.3. Research framework

![Research Framework Table]

**Figure 4:** Research framework

This framework summarises identified risks and risk mitigation strategies from the findings and analysis. Depending on a firm’s size, operations and other characteristics, a specific mitigation solution may not be applicable. This applicability is determined by the data in the findings and analysis. A firm can use this data to categorize a risk on the left column and see what mitigations are adapted to counter such a risk. More details are available in the findings and analysis or for those cited in the frame of reference. The bold crosses imply that a mitigation effect is strong.

The limitations of this framework are ones concerning data that could not be included like strategies or risks that could have emerged from interviews with big retailers or processors. In addition, the OFM where the study takes place is mature at about 7%. It means that it is in between a situation where just having the product on shelf is already an advantage since there is no competition, and a highly competitive market where suppliers and retailers can switch their business partners without consequences. Thus this framework suits for countries where OF is recognized by certification, a significant share of consumers and where supplies are limited.
6. Conclusion

This final section concludes the thesis by summarising key points, proposing its theoretical and practical contributions and presenting suggestions for further research.

The purpose of this thesis is to assess risks affecting suppliers and retailers in an OFSC and propose mitigation strategies for identified risks.

Risks assessed and identified with potential to disrupt OFSCs include sourcing risks caused by shortages in adequate supplies of locally produced organic food. These shortages have prompted firms in the food industry to seek for alternative sources of food at national, regional and global level. Firms encounter more risks while bringing in these organic imports from different countries. Product damages, increased operational costs, contaminations and delayed deliveries are some of the problems identified in local and foreign sourcing of organic food. Low conversion rates of farms from conventional to organic farming, high costs of investments required, lack of awareness among farmers are some of the factors contributing to production risks. Diseases, pests and low yields are some of the environmental-related factors preventing more farmers from engaging in organic farming. These factors contribute to a series of production risks. Risks were also identified in warehousing of organic food before distribution and these emerged in form of product damages due to poor handling, cross-contaminations because of negligent or accidental practises. As a result, product integrity is compromised which affects the value and quality of commodities in stock.

Demand risks negatively influence consumer demand for a product or availability of specific products. Low production can dictate what retail firms can sell to consumers or cause price fluctuations because of changing consumer preferences and intense competition from big retail chains. These factors affect demand forecasting due to difficulty in establishing consumer demand for a variety of products at a given time. Despite the high consumer demand, firms experience price risks attributed to changing consumer patterns. Time-consuming organic production increases levels of uncertainty in production during the transition periods. Farmers cannot sell anything and it is difficult to set prices for product that are not available on the market. Financial risks such as fluctuating interest rates, foreign currency risk or commodity price risk have an impact on operation of small firms. Financial losses can occur in form of delayed deliveries or damaged products, affecting revenue returns for concerned firms. Organic agriculture is governed by regulations requiring firms to comply within their operations. These regulations were viewed as very complex and difficult to put into practise. Any changes in these regulations might make these even more complicated to understand. This can represent an institutional risk that may also include unexpected changes in tax or credit policies. These influence how firms plan and manage their supply chains while adapting to any market changes.

Regarding the mitigation strategies as proposed by the second research question, the growth of the OFM within the next decade in Sweden will increase competition among specialized OF actors and between specialized and general firms. Suppliers likely to succeed are those able to ensure quality beyond the required standards. This could be
through thorough inspections or use of advanced production methods. Retailers able to ensure products availability on shelf and offer demonstrations and history of products are able to re-assure customers on quality. To achieve this, a supply chain needs to be strengthened with risk mitigation measures proposed in this study and summarized in the research framework. The type of mitigation strategy a firm uses depends on several factors. These include the type of risk faced, position in a supply chain, size, budget, and features of the product. Compared to a conventional food supply chain, an OFSC is most likely to take advantage of: 1) Compliance with certification and ethics related issues to avoid press scandals. 2) Visibility across the chain to connect producers to end consumers. 3) Diversification of retail channels to identify opportunities and prevent dependence. 4) Strong brand image, visible enough as a powerful actor and have preferred access to supply sources and distribution outlets.
7. Discussion

This section provides practical and theoretical implications, a reflection on the access of interviewees and further research that could be carried-out

The organic market will continue to develop with more firms involved and more assortment of products introduced on the market. Most of these products will still be imported, as local production is not anticipated to increase soon. Consumer demand will evolve further as awareness increases among more customers about healthy foods and environmental protection. Local production will not increase overnight because there are still unresolved factors such lack of awareness and regulatory challenges that might be preventing more farmers from engaging in organic agriculture. More awareness and sensitisation is essential if conversions rates are to improve drastically as well as improved subsidies for farmers. Certification regulations are important for the protection of the food industry. However, it is evident that these are not practical to apply especially for organic farmers. More efforts are needed to address this and encourage more development in organic production to improve availability of locally produced food. Stakeholders have to jointly develop initiatives aimed at extending improved subsidies as incentives to increase local organic output.

If production of local organic food does not improve, production shortages will prevail and reliance on imports will increase. However, with the cost of food products increasing globally, food imports will become a lot more costly due to increasing uncertainties in global business. Supply chains will get more complex as companies strive to access scarce food products from available suppliers. Operational costs will increase as firms develop new relationships to secure supplies and to cope with business risks. To manage these locally and globally, better identification of specific risks along respective networks is a good standing point. Relationship management and better collaboration will enhance development of appropriate mitigation or contingency plans. Risk management needs a collaborative approach to respond better to unforeseen disturbances across networks.

7.1. Practical and Theoretical Implications

The topic was formulated with the aim of deriving findings applicable in real-time for actors operating in an organic food market. The food market in Sweden will experience further growth as efforts are devoted to improving organic food production. As the industry further develops, so will risk exposure increase and will necessitate stakeholders to work proactively to seek remedies for risks that emerge as they operate their supply chains. The proposed research framework could help firms to find suitable mitigation strategies for risks across their networks. It can also be used for future research using the identified risks and suggested mitigations as a starting point.

This thesis contributes to a better understanding of the value of risk management within the food industry taking into consideration number of actors and logistics processes involved. Risks occur all the time and firms need to continuously monitor their operations to identify and respond to identified risks using some of the mitigation strategies proposed in this study.
7.2. Reflections
Initially, it was envisaged that access would be negotiated with established retail chains. However, the authors only managed to gain access to small and medium sized firms. It was not impossible gain access with the leading retail chains to due to a number of factors such as:

- Internal organisational arrangements as far as research is concerned, external requests for interviews could not be granted.
- Some initially showed interest but later declined participating in any interviews.
- Others were not interested due to time constraints and work commitments.

It was at this point that attention was directed to Small and medium firms that were interested in the research topic. These firms were forthcoming with positive responses to requests for interviews, which were subsequently scheduled and conducted. Most of these firms are family owned and the owners were keen to share their experiences and knowledge of the organic food market. Some of them have not been in business for long so they were inquisitive to learn as well and engage in discussions on various concepts during interviews.

7.3. Limitations and Further Research
The findings of this study and delimitations provide possible areas for further research. The study focused on suppliers and retailers only yet a typical food supply chain involves a lot more firms or actors and processes. During the interviews and analysis processes, the authors felt the findings would only provide half the impression of OFSC. Supply chains were not examined in their entirety that is, from farm to end-consumers. This requires exploring the roles and understanding risks situations of every supply chain member. Time constraints could not enable such a study to be conducted, as it requires lengthy timeframes to accomplish. In this study, findings are derived from only two entities (suppliers and retailers) which does not reveal the full extent of how every supply chain firm assesses and mitigates risks. It is relevant to examine particularly the role of suppliers in OFSCs with a focus on second and third tier suppliers. This is because from the interviews, there was an impression from every respondent that they only focus on first tier suppliers. It is unknown what role second and third suppliers play in the food industry given the importance of visibility and traceability for all stakeholders involved.

Extensive research could be conducted covering more countries, major retailers and processors to understand how linkages in food chains are affected by different risks. A risk assessment model could be developed to enable firms to identify, classify and weight impact of specific risks to mitigate the most critical ones. Further research could also focus on specific successful products such as milk or eggs to analyse in detail, review a specific supply chain, and establish how such success was achieved. Additionally, studies could explore how other products could follow the same strategies.
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Appendix 1: Comparing conventional and organic production risks

A study from Tiedemann and Latacz-Lohmann (2013) compared the level and determinants of output variability for organic and conventional arable farms. The influencing factors include soil quality, diversification of the cropping programme and the farm manager’s level of training. After analysing the output variance, that is the relative variability of the production level, the authors found “no significant differences between the two farming systems”. The authors conclude about risk influential factors that “Higher output variability can be observed for both farming systems as the farmed area and total labour input increase. Risk-reducing influences, on the other hand, are better soil quality, the use of high-quality seed and a higher capital input. Additionally, in organic farming, diversified crop rotations also result in a reduction of risk.” They found that on average, the production deviates from the mean of 20% for conventional and 20% for organic. These results contrast with the conclusion of Gardebroek et al., (2010) who found farm output to be more variable in the organic farm in their sample of Dutch arable farms.

Currently, the farmers are aware and concerned by organic conversion. KRAV (2015) reports that “In a survey in the spring 2014, 94% of farmers who were not KRAV-certified answered that they do not expect to be certified within the next five years. [...] only 10% believe that KRAV-certified farms are modern and profitable, [...]. The largest obstacles mentioned were the question of whether or not the increased price compensates for the extra costs and trouble with weed control. Uncertainty about the structure and levels of government subsidies is also an inhibiting factor.” However, these concerns need to be balanced with the higher selling price from 10 up to 200%, the subsidies including the “greening” component of the CAP, the increasing demand since many years and the risk of accidents due to the utilization of hazardous products.

Appendix 2: The CAP in details

According to Bourgeois (2008), the CAP was originally created to mitigate the agricultural risks within the six European exporting and importing countries. It aimed at increasing food production to get low prices and security, but at the same time, to ensure that this abundance of food will not threaten the farmers by triggering low prices. The policy succeeded in the 80’, the food is abundant and even though preventive measures were settled, it triggers crisis within the sector. Then quotas were settled for some products such as milk, which is not easy to export due to its fragility. After, the fall of the Berlin’s Wall, the U.S. accuse Europe of unfair competition and the emergence of new agricultural power such as Brazil encourage a new CAP in 1993. Since then, the direct payment system to farmers is the main tool of the CAP to mitigate production and financial risks.

This common policy covers three dimensions (Overview of CAP reform 2014-2020):

Economic: Food security and globalization, declining rate of productivity growth, price volatility, pressures on production costs due to high input price and the deteriorating position of farmers in the food supply chain.

Environmental: resource efficiency, soil and water quality, threats to habitat and biodiversity.

Territorial: Demographics of rural areas, economic and social developments including depopulation and relocation of businesses.

The first pillar of funding of the CAP
It represents 31274 billion euros for the 2014-2020 period (2013 prices). It is composed of the Common Organisation of the Market (CMO) which has an internal aspect which
covers market intervention and rules on marketing and producers organisations. The external aspect encompasses the trade with other countries, the import and export certificates, import duties, administration of tariff quotas and export refunds. (Ragonnaud, 2015).

Besides the CMO, the first pillar also contains direct payments to farmers divided in 7 components of which the first three only are compulsory. 1) a basic payment per hectare; 2) a ‘greening’ component, as additional support to offset the cost of providing environmental public goods not remunerated by the market, it has to represent 30% of the state’s national direct-payment allocations; 3) an additional payment for five years for young farmers. Indeed, in 2013, only 14% of farmers were less than 40 years old; 4) a redistributive payment whereby farmers may be granted additional support for the first hectares of farmland; 5) additional income support in areas with specific natural constraints; 6) coupled support for production, granted in respect of certain areas or types of farming for economic and/or social reasons; 7) a simplified system for small farmers, with payments of up to EUR 1 250. (Massot, 2016). These direct payments consist of one third of the income of European farmers (Farm Europe, 2016).

The second pillar of funding of the CAP It represents 95.58 billion euros for the 2014-2020 period (2013 prices). It is called the Rural Development Policy and has 6 priorities: Develop base knowledge in rural areas, increase the viability and competitiveness of all types of agriculture, organisation of the food chain and risk management in farming, restore and preserve agricultural and forest ecosystems, promote the efficient use of water and support a transition to a low-carbon economy, to promote social inclusion and economic development. (DG Agriculture, 2013)

The Greening component of the CAP Some elements of a farm are useful for the preservation of the environment but are not rewarded financially. In this context, Member states must now use 30% of their national funding allocations for greening payment. The measures are the following:

"crop diversification: the farmer must cultivate at least two different crops if he has more than 10 hectares of arable land; if he has more than 30 hectares, he must cultivate at least three crops; the main crop may cover no more than 75% of the arable land, and the two main crops no more than 95%;
maintaining existing permanent grassland;
maintaining an ‘ecological focus area’ of at least 5% of the arable area of the holding on farms with more than 15 hectares of arable land (excluding permanent grassland and permanent crops): edges of fields, hedges, trees, fallow land, landscape features, biotopes, buffer strips, afforested areas or nitrogen-fixing crops.

There will be extremely severe penalties for failing to meet greening requirements. Anyone who does so once the transitional period is over could forfeit up to 125% of greening payments. No additional requirements are imposed on organic producers, as the practices they use have been shown to provide clear ecological benefits. For others, agri-environmental schemes may incorporate measures that are considered equivalent. The new regulation contains a list of such equivalent measures. To avoid double funding of such measures, payments under rural development programmes must take account of the greening requirements." (Massot, 2016, p.2)

Appendix 3: Changes of organic product legislation brought by the EC proposal of March 2014
The EU legislation for organic products is about to change. Indeed, the European Commission published on March 2014 a proposal to change regulation of organic agriculture. The objective is to ensure consumers’ trust in a growing market. The Commission has concerns that the growing market will foster frauds and eventually provokes a loss of customer confidence. Some of the measures proposed are the better control of pesticides residues with a possible threat for the farmer to lose the certification if limits are exceeded. These limits of residues will be applied to imports and some fear that it may cut off the supply. The proposal also wishes make the use of 100% organic ingredients mandatory, since nowadays a great variety of products can be found under their organic form. The side-by-side culture of organic and non-organic culture would be impossible to avoid contamination. It also wants to make possible for small farmers to team up and be certified as a group. The imports will be concerned by the rules. The Commission has pinpointed that the application of the reform, which is thought to come to an agreement in 2016, would be gradual. Farmer would then have time to adapt, especially for the side-by-side culture rule. (IFOAM EU Group, 2014) (FIBL and IFOAM, 2016). Also, the new CAP described upon brings financial advantages for organic farmers, since they qualify automatically for the greening payments, which consists 30% of the CAP direct payments.

Appendix 4: Characteristics of traditional (TC) and New Generation (NGC) Marketing Cooperatives. (Coltrain, 2000)

<table>
<thead>
<tr>
<th>CUSTOMER ROLE BUSINESS FUNCTION</th>
<th>TC</th>
<th>NGC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DELIVERY RIGHTS</td>
<td>Unlimited</td>
<td>Limited to purchased</td>
</tr>
<tr>
<td>DELIVERY OBLIGATION</td>
<td>None</td>
<td>Required</td>
</tr>
<tr>
<td>QUALITY ACCEPTED</td>
<td>Broad</td>
<td>Narrow</td>
</tr>
<tr>
<td>IDENTITY PRESERVED</td>
<td>Usually not</td>
<td>Usually is</td>
</tr>
<tr>
<td>INITIAL PAYMENT</td>
<td>Market price</td>
<td>Contract price</td>
</tr>
</tbody>
</table>

PATRON PROFIT DISTRIBUTIONS

<table>
<thead>
<tr>
<th>Cash Patronage Rate</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment or Retained Profits</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Pooling Distributions</td>
<td>Rare</td>
<td>Common</td>
</tr>
</tbody>
</table>

OWNER INVESTMENT OBLIGATIONS

<table>
<thead>
<tr>
<th>Initial Investment</th>
<th>Very low</th>
<th>Very high</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportionality to Use</td>
<td>Low to high</td>
<td>Very high</td>
</tr>
<tr>
<td>Liquidity or Exchangeability</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Exchange Value</td>
<td>Fixed at par</td>
<td>Variable at market</td>
</tr>
<tr>
<td>Redemption Obligation</td>
<td>Ability to pay</td>
<td>None</td>
</tr>
<tr>
<td>Business Expansion Investment</td>
<td>None</td>
<td>High for delivery rights</td>
</tr>
</tbody>
</table>

MEMBER VOTING CONTROL

<table>
<thead>
<tr>
<th>Eligibility Restrictions</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voting Power</td>
<td>Usually one vote</td>
<td>Variable number</td>
</tr>
</tbody>
</table>

The characteristics of the NGC are (ARDI, 1999); membership is defined or closed; delivery shares usually represent a high level of initial equity investment to which delivery rights are tied; delivery shares embody these delivery rights within contracts which define both rights and obligations of the producer and the cooperative; these shares are transferable or tradeable. They can appreciate or depreciate in value to reflect members expected returns over time. However, this structure can still be viewed as a mixed form, as Ortmann and King (2007) reports; Harte, as cited by Royer (1999), also suggested a life cycle model in which cooperatives are initially useful organizations for correcting or mitigating market failure. The need for cooperatives decrease, however, as market performance improves. As transaction cost theory indicates, inefficient governance structure in competitive markets will over time be replaced by efficient
structures. In their study, Carlberg et al., (2006) have identified the most relevant elements that make NGC successful. The study grouped the respondents by commodity type. One category interviewed the NGC operating within the organic, vegetable and seafood sectors. The authors point out that “the factors that are important to the success of this type of enterprise are often quite different than those for other kinds of NGCs”. Indeed, they identified customer service as important, in which the NGCs included web interfaces and active customer preferences gathering. The product quality is relevant since it justifies the quality premium earned by organic farmers. The product uniqueness attracts customers looking for social and environmental benefits, which are provided by this type of product. The importance of brands that refer to the local cultivation is also emphasized, as illustrated by the “Organic Valley” cooperative. Finally, strong local leadership and low operating costs, as opposed to marketing investments, are considered as relevant.

Appendix 5: The types of CSA

The CSA system ensures the farmer that its production costs are covered, it reduces the risks related to production and save the time usually needed for marketing. The land used can be the result of a common agreement between landowners, which decide to create a large parcel suitable for agriculture or animal grazing.

Several forms of CSA, some diverging from the original idea, can be identified (CSA.org.uk, 2016):

“Producer-led: A farmer offers a share of production in return for a fixed subscription. The share may vary with the vagaries of production (so the risks and rewards are shared), while the subscription is generally payable in advance and for a relatively long term (providing secure income to the producer). This is the most widely used approach in the UK and is also common in France and the USA.

Producer-community partnerships: The enterprise, owned by the community through a co-operative or similar structure, works in close partnership with existing producer(s) to provide a secure and long-term supply of produce to CSA members.

Community-led: A farming enterprise is set up and owned by the community, which takes on direct responsibility for production. Labour may be provided by volunteers and/or employed professionals. Produce may be distributed amongst the community and/or sold for the benefit of the enterprise, including using the share of the harvest model.

Community-owned farms: A farming enterprise is secured through community investment but does not necessarily trade primarily with the community members.”