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Farmers' Behaviour in Risky Decision-making

- A multiple case study of farmers' adoption of crop insurance as a risk management tool

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Uppsala, January 2018



Martin Enström



Johan Eriksson

Summary

Risk is highlighted as an increasingly present aspect of the agricultural business, and it is important for agricultural producers to manage risk effectively. The implementation of risk management strategies and the adoption of risk management tools are some of the most complex decisions for farmers to execute. For Swedish farmers the private crop insurance is one available risk management tool to mitigate production risks caused by unforeseen weather events. Farmers' decision behaviour in situations that include risk and uncertainty is a reflection of their risk propensity and risk perception. To explain farmers' adoption of risk management strategies it is important to understand their decision-making behaviour.

Earlier studies of farmers' risky decision-making behaviour use a quantitative approach to evaluate how the determinants risk propensity and risk perception interplay in farmers' choice to implement a certain risk management strategy. In this study a qualitative multiple case study approach is applied to evaluate farmers' decision to purchase crop insurance as a risk management tool. The aim is to investigate underlying factors of risky decision-making behaviour, and their importance for farmers' decision to purchase a crop insurance.

The results of this study is based on 13 interviews with crop farmers in the region of Scania in the southern part Sweden. The type of interviews that is used are semi-structured interviews that was analysed through thematic coding. The interviews were based on the Sitkin and Pablo (1992) model of decision-making behaviour under risk and uncertainty. This study contributes with knowledge about what underlying factors that are of importance for farmers' crop insurance decision in the studied context. It also contributes with a suggestion to include the factor of status quo, to describe the farmers' behaviour in their continued decision to purchase a crop insurance. The results of this study imply that the underlying factors of importance to describe farmers' behaviour differ depending on if the decision is conducted for the first time, or if it is a repeated decision.

Sammanfattning

Risk beskrivs som en betydande aspekt inom ett lantbruksföretag och det är viktigt att lantbrukare kan hantera risker på ett effektivt sätt. Implementeringen av strategier och olika typer av riskhanteringsverktyg är några av de mest komplexa beslut en lantbrukare behöver överväga i sin verksamhet. För svenska lantbrukare är den grödaförsäkring som tillhandahålls av privata försäkringsbolag ett tillgängligt riskhanteringsverktyg för att minska produktionsrisker orsakade av oförutsedda väderhändelser. Lantbrukares beteende i beslutssituationer som inkluderar risk och osäkerhet styrs av deras riskbenägenhet och riskuppfattning. För att förklara lantbrukares anammande av strategier och verktyg för att hantera risker är det viktigt att förstå deras beteende i beslutssituationer.

I tidigare studier av lantbrukares beteende i beslutssituationer som innefattar risk har en kvantitativ ansats tillämpats för att utvärdera hur determinanterna riskbenägenhet och riskuppfattning interagerar i lantbrukares beslut att implementera riskhanteringsstrategier. I den här studien tillämpas en kvalitativ multipel fallstudie för att utvärdera lantbrukares beslut att införskaffa en grödaförsäkring som ett riskhanteringsverktyg. Målet är att undersöka underliggande faktorer i beslutssituationer som innefattar risk och osäkerhet, samt deras betydelse för beslutet att införskaffa en grödaförsäkring.

Resultaten i den här studien baseras på 13 intervjuer med lantbrukare med inriktning mot växtodling i Skåne. Det empiriska materialet har samlats in genom semistrukturerade intervjuer som analyserats genom tematisk kodning. Den intervjuguide som använts utgår ifrån Sitkin och Pablos (1992) modell om beslutsfattarens beteende i beslutssituationer som innefattar risk och osäkerhet. Studien bidrar med kunskap om de underliggande faktorerna som är av betydelse för lantbrukares grödaförsäkringsbeslut inom den kontext som studerats. I studien adderas även den underliggande faktorn ”status quo” för att beskriva lantbrukarnas beteende i det årligen upprepade beslutet att fortsätta införskaffa en grödaförsäkring. Resultaten i den här studien antyder att de underliggande faktorerna av betydelse för att beskriva lantbrukares beteende skiljer sig åt beroende på om beslutet fattas för första gången eller är ett årligen upprepat beslut.

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1 Introduction

The agricultural producers in the European Union (EU), including Sweden, face a series of risks that may have an impact on the income and welfare of their business and household (Diaz-Caneja *et al.*, 2008). Risk is highlighted as a present aspect of agricultural business, and it is a priority area for agricultural producers to manage risk effectively (Annerberg, 2015). The main risks in agriculture are related to weather conditions, pests and diseases, technological change, and income variability due to production and price variations (Diaz-Caneja *et al.*, 2008). Farmers face a situation where they produce without complete certainty about what will happen to their production (Kahan, 2008). They spend large amount of resources on inputs in their production without knowing what the outcome will be. Unforeseen weather events and natural disasters are beyond the farmer's control and is considered to be a significant source of risk by farmers in the EU (Székely & Pálincás, 2009).

Farmers' risk management work is founded on the capacity of the individual and the structure of their business to withstand adverse outcomes (Huirne *et al.*, 2007; Hardaker, 2004; Huirne *et al.*, 2000). The implementation of risk management strategies and the adoption of available risk management tools is some of the most complex decisions for farmers to make in order to mitigate economic volatility (Coble *et al.*, 2000). Hardaker (2004) states that the risk sources in agriculture can be categorised as business risks and financial risks. Business risks include risk linked to production, market, institutions and the individual. The risks connected to price and production is possible to manage by applying risk management tools available on the market. Price risks are connected to the uncertainty of the price on inputs and outputs in the agricultural sector (Hardaker, 2004; Moschini & Hennessy, 2001; Harwood *et al.*, 1999). To mitigate price risk farmers can use risk management tools such as futures and options, contracts, and spread sales. Production risks are linked to the unpredictable nature of the weather and the uncertainty about the performance of crops and livestock connected to pest, diseases and other unpredictable aspects (Hardaker, 2004; Moschini & Hennessy, 2001; Harwood *et al.*, 1999). Production uncertainties and its effects on farms' financial stability has generated interest in providing risk management tools to protect agricultural producers from production risks (Coble & Knight, 2002). Crop insurance is a commonly used risk management tool to share the yield risk (*ibid.*), and it is argued that crop insurance is a risk management tool that might gain importance in the future (Finger & Lehmann, 2012).

Crop insurance has for a long period of time been an important risk management tool for farmers in the North American market. It is possible to insure against both abnormalities in farm revenue and yield (Diaz-Caneja *et al.*, 2008). The insurance market in the EU differs from the North American market and has a tradition to focus on hail- and multi-peril insurance (Finger & Lehmann, 2012). The crop insurance market in Sweden does not include governmental subsidies and the insurance is provided by private insurance companies in the agricultural sector. On the Swedish market, crop insurance is limited to hail damage and reseeded, but there is no full-coverage harvest loss insurance available (Madre & Devuyt, 2016). Even though the protection included in the crop insurance in Sweden is limited, there is still incentives for farmers to purchase the insurance to hedge against some of the weather events beyond their control, and thereby mitigate their overall exposure to production risks.

1.1 Problem

Farming is a complex business with uncertainties arising from various sources of risks, therefore it offers an interesting case to investigate from a risk management perspective (Hardaker, 2004). Agriculture includes several uncontrollable elements, one example is weather, that plays a fundamental role in agricultural production (Moschini & Hennessy, 2001). It is stated that farmers may face more challenging conditions due to changes in the environment and more frequent extreme weather events in the future (Falco *et al.*, 2014).

On markets where it is possible to insure crops, crop insurance may play an important role in farmers' adaption to climate changes (Falco *et al.*, 2014; Finger & Lehmann, 2012). Crop insurance is an available risk management tool that farmers can adopt to mitigate the potential economic effects of production risks. Extreme weather events may lead to increased volatility in farm revenue and farmers' ability to manage these fluctuations is an effect of their risk behaviour (Falco *et al.*, 2014). To understand farmers' behaviour from a risk management perspective, it is necessary to identify farmers' perceptions of and responses to risk (Flaten *et al.*, 2005). Attitudes towards risk, also referred to as risk preferences, are considered of major importance in farmers' decision-making behaviour in situations that includes risk and uncertainty (Pennings & Leuthold, 2000).

A traditional approach when studying farmers' decision-making under risk is to use the economic theory of expected utility (Flaten *et al.*, 2005). However, the expected utility theory does not take the subjective emotions of the decision-maker into account (Hammond, 1998), and is sometimes criticised for its limitations to correctly describe the decision-making behaviour observed in reality (Flaten *et al.*, 2005). Since not all uncertainties can be described as an objective probability, individual values and beliefs are therefore likely to be of importance in farmers decision-making under risk (Willock *et al.*, 1999). For example, there seems to be an absence of correlation between people's perceived risk and measurable probabilities (Botterill & Mazur, 2004). Therefore, it is of importance to understand how farmers' perceive farm-related risks and uncertainties and their behaviour in those situations. One model that takes individual subjective values and beliefs into account in decision-making is the model presented by Sitkin and Pablo (1992). It is a quantitative model that use the mediating determinants risk propensity and risk perception to describe important underlying factors in individuals' decision-making behaviour, when facing risk and uncertainty. Risk propensity is the degree an individual is willing to accept the risk of a loss and risk perception is a subjective judgement about characteristics and severity of a risk. The behavioural approach has gained importance in the context of farmers' decision-making behaviour and their adoption of risk management strategies (van Winsen *et al.*, 2016; Sulewski & Kłoczko-Gajewska, 2014; Flaten *et al.*, 2005). Still there is limited empirical evidence that explain farmers' decision-making behaviour under risk and uncertainty from a behavioural perspective. This study addresses this issue by investigating underlying factors in farmers' decision to apply crop insurance as a risk management tool.

1.2 Aim and Research Question

The aim of this study is to investigate underlying factors of risky decision-making behaviour, and their importance for farmers' decision to purchase crop insurance. This is studied in the context of crop farmers in the region of Scania in the southern part of Sweden.

To fulfil the aim, the following research question is formulated:

Which underlying factors are included in crop farmers' decision to purchase a crop insurance as a risk management tool?

Earlier studies of farmers risk attitudes, perception of risk and risk management in the EU uses a quantitative approach to analyse the determinants of risk behaviour and its connection to the implementation of risk management strategies (van Winsen *et al.*, 2016; Flaten *et al.*, 2005; Koesling *et al.*, 2004; Meuwissen *et al.*, 2001). A study by van Winsen *et al.* (2016) show how the determinants risk perception and risk attitude interplay in the choice of implementing certain risk management strategies. The study provides knowledge concerning farmers' intention when they implement risk management strategies in their business. Flaten *et al.* (2005) study Norwegian dairy farmers' perception of risk and risk management. They focus on the relation between farm and farmer characteristics, risk perception and the implementation of common risk management strategies. The most important risk sources according the study seem to be institutional and production risks. Koesling *et al.* (2004) study crop farmers' perception of risk and risk management strategies. They identify and link socio-economic variables to the farmers' risk perception. These variables influence how farmers evaluate sources of risk, and their choice of risk management strategies. Meuwissen *et al.* (2001) conduct a survey study of livestock farmers' perception of risk and risk management in the Netherlands. They analyse if certain characteristics are connected to the farm or farmer, that relate to their risk perception. The perception of risk and risk management seem to be connected mainly to personal characteristics of the farmer. The farmers' also perceive that price risks and production risks are the most important risk sources in their business. These studies cover several of the risk domains, but do not explicitly study the underlying factors important for farmers' decision-making behaviour under risk, in the context of crop production and crop insurance. In this study a qualitative approach is used to investigate farmers' decision-making behaviour, based on empirical data from semi-structured interviews. The underlying factors is identified through personal in-depth interviews which generate material that is analysed through thematic coding.

1.3 Contribution

Risk management in agriculture is expected to gain importance in the future. Despite that, risk management at farm level has received limited attention in the European agricultural sector (Huirne *et al.*, 2007). Flaten *et al.* (2005) states that it is important to identify farmers' perceptions of and responses to risk to understand their risk behaviour and adoption of risk management strategies. There is an absence of studies that explicitly investigate crop farmers' risk perceptions and the ways they deal with risks (Flaten *et al.*, 2005; Koesling *et al.*, 2004). Earlier studies have through a quantitative approach studied the factors of importance for farmer's adoption of risk management strategies and risk management tools. The empirical knowledge about the underlying factors of farmers' risk behaviour in the domain of crop insurance has not been studied before, in a Swedish context and through a qualitative approach. The study declares which underlying factors of risk propensity and risk perception that are central in farmers' risk management work, regarding the decision to purchase a crop insurance. The findings are valuable to understand the behaviour of crop farmers that operate in a similar context as the farmers included in this study.

Only a limited number of studies have investigated crop farmers perception of risk, and how they deal with risks (Koesling *et al.*, 2004). There are no earlier studies that explicitly study this in a Swedish context. The study contributes with findings about crop farmers' perception of production risks in the region of Scania in Sweden, and why they find crop insurance as a useful risk management tool. Since the decision to purchase a crop insurance is executed every year

the study also provide knowledge about the underlying factors of importance to describe if the farmers' behaviour differ in the continued decision compared to the initial decision.

A completely private crop insurance market without governmental support is unusual. Some research indicates that private crop insurance solutions is only attractive on markets with high levels of governmental subsidies (Enjolras *et al.*, 2012). The study provides knowledge about farmers' decision-making behaviour in their crop insurance decision. From a practical perspective this could be of interest for farmers to understand their decision-making behaviour when they adopt risk management tools in their businesses. It could also be valuable information for insurance companies and agricultural advisors to develop risk management tools that improve farmers' resilience to financial backlashes, due to unforeseen weather events and other production risks.

1.4 Delimitations

The study is a qualitative study of 13 crop farmers in the region of Scania. The focus is to investigate farmers specialised in crop production, cultivating at least 200 hectares of arable land, and have a significant part of their revenues originating from grown crops. The reason for delimitating the cases in farm size and specialisation is to find farmers working almost full time with agriculture with limited possibilities to manage risks through complementary off-farm incomes and diversification. Since the focus of this study is to evaluate the decision to adopt crop insurance as a risk management tool, all the farmers have a crop insurance at the time of the study, and Dina Försäkringar is their insurance provider.

In this study, the importance of underlying factors of risky decision-making behaviour is evaluated by using Sitkin and Pablos' (1992) model as a research base. A qualitative approach is used to answer the research question and to investigate the underlying factors of risky decision-making behaviour. Even though the study does not statistically quantify the significance of the determinants risk propensity and risk perception to farmers' decision-making behaviour, it can provide additional knowledge about underlying factors of importance in farmers' decision behaviour when they decide to purchase a crop insurance.

1.5 Outline

In this section the outline of the thesis is presented, see figure 1. This will guide the reader through the structure of the thesis. Previously in this chapter the introduction, problem and aim of this thesis has been presented. In chapter two the theoretical framework will be presented, containing existing literature in agricultural risk management and decision-making behaviour under risk and uncertainty. In chapter three, the methodological approach is presented. This is complemented by a discussion of the chosen method, ethical aspects and the data collection procedure. Chapter four starts with an empirical background and a description of the 13 cases, followed by a presentation of results and analysis in chapter five. The findings in the empirical material are further discussed in chapter six together with the conclusions made in the study.

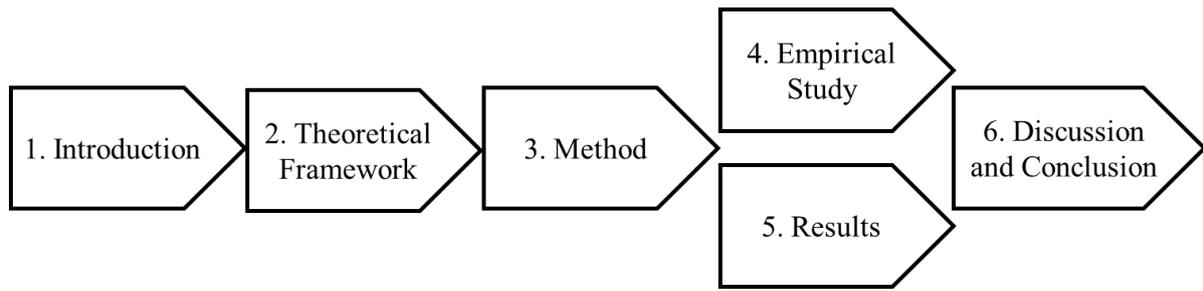


Figure 1. Outline of the thesis

2 Theoretical Framework

This chapter presents the theoretical overview of the field of risk management decisions and risk behaviour in agriculture. It aims to establish an understanding of existing literature in this field and starts with a general description of risk and uncertainty and its role in risk management. Different sources of agricultural risks are then discussed together with existing strategies to manage risk in agriculture. Farmers' attitudes towards risk are described and different theories on how managers make decisions under risk from an economic and psychological perspective are presented. This includes an economic approach to decision-making followed by a more psychological approach by using the Sitkin and Pablo (1992) model of managerial decision-making under risk and uncertainty. The chapter ends with an integration of the behavioural perspectives in farmers' decision-making under risk and their adoption of risk management instruments.

2.1 Risk Management in Agriculture

“Risk management is defined as the systematic application of management policies, procedures and practices to the tasks of identifying, analysing, assessing, treating and monitoring risk” (Hardaker, 2004; Huirne *et al.*, 2000). Risk management literature includes two central concepts, uncertainty and risk. These concepts are closely related, but not equivalent. The main distinction is that a risk is defined as a situation when it is possible to make an objective probability assessment. In other words, risk represents a situation where the possible outcomes of an event is known with certainty (Chavas, 2004). Uncertainty implies an absence of certainty of the outcome of an event, i.e. it is uncertain what will happen. Uncertainty is necessary for risk to occur, but does not always lead to a risky situation (Harwood *et al.*, 1999).

Uncertainty and risk are prevalent in the society and in the agricultural sector they constitute an essential part of the production environment (Hardaker, 2004; Moschini & Hennessy, 2001; Huirne *et al.*, 2000). Little practical use, with a few exceptions, has been made of risk analysis in agriculture. The reason for the limited attention may be an effect of effective eliminations of some sources of risk, due to governmental involvement such as the Common Agricultural Policy (Huirne *et al.*, 2000).

Uncertainty in agriculture could concern, quantity and quality of production outputs and inputs, or weather and climate change (Moschini & Hennessy, 2001; Harwood *et al.*, 1999). The fact that the agricultural sector has long turnover periods and acts on a market with volatile price levels are also an important sources of uncertainty (Musser *et al.*, 1996). Economic issues in a long-term perspective, and new innovations and technologies have also been shown to be sources of uncertainty (Moschini & Hennessy, 2001). New policies and changes in quota systems are other factors that contribute to the overall uncertainty within the agricultural sector (McDonald *et al.*, 2014).

Gabriel and Baker (1980) divide the concept of risk in two categories, business risk and financial risk. The concept of business risk is reflected in the variability of the farm's net operative income (Martin, 1996). The added variability in net cash flow of the owner's equity is defined as financial risk (*ibid.*). The objective of applying risk management strategies is to reduce the chance of ending up in a vulnerable situation (*ibid.*). Risk management helps the farmer to avoid losses, but also to maximise opportunities (Huirne *et al.*, 2000). It includes finding a portfolio of risk prospects that is efficient and consistent with the individual preferences of the farmer.

Hardaker (2004) defines several different types and sources of business risks and financial risks in the agricultural sector. Financial risks involve the risk of financing the firm (Hardaker, 2004). The borrowed funds that provide the business with capital means that a share of the profit must be allocated to pay interest rates on the debt capital. There is also a risk that external financiers of the business may change the interest rates, recall a loan unexpectedly, or is unwilling to fund new loans (*ibid.*). The business risks are categorized as production risk, market or price risk, institutional risk, and personal risk (see figure 2). In production the main sources of risk are uncertainty about weather and the performance of crops and livestock (*ibid.*). Market risk includes uncertainty about prices and volumes of inputs and outputs needed to operate the farm. The institutional risks involve changes in government policies, for example changed legislation, tax rules, production restrictions, trade agreements, and business relations. The personal risk is connected to the farmers' personal traits and how the farm is operated (*ibid.*).

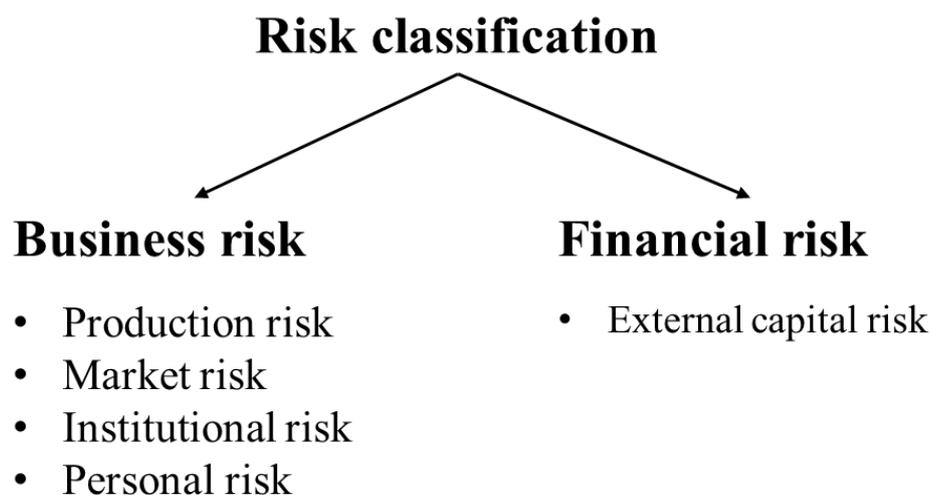


Figure 2. Categorisation of risk and risk sources based on Gabriel and Baker (1980) and Hardaker (2004), own processing.

2.1.1 Strategies for Managing Risk

In agriculture, the main objective of risk management is to reduce the chance to end up in an economically vulnerable situation, it is also important to achieve the highest possible returns on equity consistent with the owners attitudes towards risk (Martin, 1996). Risk reduction, risk mitigation and risk coping are three risk management strategies used by farmers in order to minimise their exposure to risk (Antón, 2009; Holzmann & Jørgensen, 2001), see table 1.

Table 1: Risk management strategies and tools available for farmers based on Holzmann and Jørgensen (2001) and Antón (2009), own processing.

Strategies	Farm/community	Market
Risk Prevention	Technological choices	Training on risk management
Risk Mitigation	Production diversification	Futures and options Insurance Vertical integration Production/marketing Contracts Spread sales Diversified financial investment Off-farm work
Risk Coping	Borrowing and intra-community charity	Selling financial assets Saving, borrowing from banks

Risk prevention strategies involve methods that may prevent risky situations. Prevention strategies aim to reduce the probability of a downside risk (Holzmann & Jørgensen, 2001). A downside risk is associated with potential losses, i.e. the risk that actual return is below the expected return. A preventive risk management strategy may increase the farmer's expected income and also reduce the income variance. This will increase the overall wealth of the farmer (Antón, 2009). Risk mitigating strategies decrease the potential impact of a future down-side risk for the farmer (Holzmann & Jørgensen, 2001). This strategy is also employed before the risk occurs, but aims to reduce the potential impact of the risk instead of reducing the probability of the risk (Antón, 2009). Portfolio diversification, informal and formal insurance mechanisms, and hedging are examples of risk mitigation (Holzmann & Jørgensen, 2001). Risk coping strategies aims at relieving the impact of the risk once it has occurred (*ibid.*). This strategy is common when the farmer faces unusual risks, such as a catastrophe (Antón, 2009). The idea is to build up assets in good years and consume it in more unfavourable years, i.e. a self-insurance.

2.1.2 Risk Mitigation and Crop Insurance

One of the risk management tools available for farmers to mitigate agricultural risks according to Antón (2009) and Holzmann and Jørgensen (2001) is agricultural insurance which include crop insurance. Crop insurance is a risk management tool used to mitigate production risks such as variations in yield due to adverse weather conditions. A crop insurance is a contract where the farmer pays a premium to the insurer. The contract includes the right to gain compensation at the occurrence of weather events that is covered by the insurance (Antón, 2009). Crop insurance have globally existed for a long period of time and are often relying on governmental subsidies to exist (Moschini & Hennessy, 2001). The need of governmental support is a result of the systemic risks that farmers' face, this since the individual yield losses often is not independent. Geographically, extensive unfavourable weather events significantly correlates with individual farm-level yields which lead to high levels of risk per unit of premiums for the insurance companies (Miranda & Glauber, 1997). The insurance companies need to pass the

costs of bearing the risk to the farmers, which causes high premium levels (*ibid.*). Due to low average pay-outs relative to the insurance premiums, private multi-peril crop insurance are argued to be of low interest for farmers (Moschini & Hennessy, 2001).

Private crop insurance markets focus on providing insurance against events that are more non-systemic, such as hail and reseeding insurance, that in general affect a smaller geographical area and a limited number of farmers at the same time (Miranda & Glauber, 1997). Hail insurance are stated to be adequately provided by private crop insurance companies since the occurrence of hail is more non-systemic than other perils (Nieuwoudt *et al.*, 1985). In Sweden, only hail and reseeding are included in the available crop insurance schemes provided by the private insurance companies, and there is an absence of multi-peril crop insurance products as an effect of the limited governmental support (Smith & Glauber, 2012). However, it is still necessary for crop farmers to think about their protection against unforeseen weather events as a part of their risk management strategy. Farmers adapt their decision to their surrounding context and the risks they encounter. This is well discussed in the literature, but the understanding of why that specific risk-response occurs and how it motivates observed behaviour is limited (Just & Pope, 2003).

2.2 Decision-making under Risk and Uncertainty

A situation where a farmer faces a situation with a choice between alternatives always constitutes a decision problem (Officer & Anderson, 1963). Economic theory within decision-making normally describes a situation where the outcome of an event is known with certainty. However, “real world” decisions are nearly always conducted in the face of risk and uncertainty about the outcome (*ibid.*). Several different theoretical approaches try to explain how individuals conduct decisions under risk (Johnson & Busemeyer, 2010). In the following section the expected utility theory is presented as a model of how decision-makers are assumed to behave in decision-making situations that includes risk. This theory is an explanation of how the rational decision-maker make decisions that maximise the outcome. After that the behavioural approach to decision-making behaviour is presented to explain the limitations of the expected utility theory by including the subjective values and beliefs in individuals’ decision-making behaviour.

2.2.1 Expected Utility Theory

In the field of economics the expected utility theory is commonly used to study decision-making under risk and uncertainty (Starmer, 2000; Thaler, 2000). It is the most widely accepted normative model of rational decision-making (Meyer, 2002), and it has also been applied in more descriptive models of decision-making under risk and uncertainty (Thaler, 2000). Economic choices under risk and uncertainty involves a trade-off between risk and expected return (March & Shapira, 1987). The main assumption in the expected utility theory is that the decision-maker is expected to make rational choices that maximise his or her utility. It is founded on the concepts of rationality and optimality (Einhorn & Hogarth, 1981). To be able to make optimal decisions the individual is assumed to be completely informed, infinitely sensitive and completely rational (Edwards, 1954). It is also assumed that the decision-maker has stable and well organised system of preferences and the needed skills to calculate for all alternative options available (Simon, 1955; Edwards, 1954).

Risk is associated with the farmers’ attitudes towards risk, also referred to as preferences. The decision-maker can be either risk averse, risk neutral or risk seeking (see figure 3). Before

choosing between risk and return combinations, the decision-maker is assumed to first make calculations among the alternatives (March & Shapira, 1987). Risk is connected with the expected return of an action, a riskier alternative often includes higher profit but is also more volatile (Barry, 1984). The utility functions are used to describe the decision-makers' attitudes towards risk. The risk attitude influences the curvature of the utility function based on the trade-offs between potential return and levels of risk.

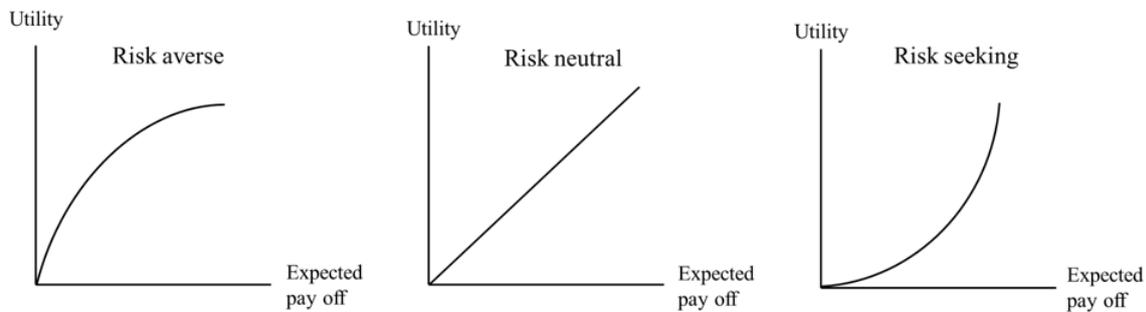


Figure 3. The shape of the utility function in relation to personal risk preferences based on Barry (1984), own processing.

The expected utility approach has been criticised for neglecting the subjective emotions and perceptions of the decision-maker, because not all uncertainty can be described as an objective probability (Hammond, 1998). Therefore, the subjective expected utility has been introduced as a more descriptive measure of how attractive an economic opportunity is for the decision-maker in the presence of risk. The subjective expected utility introduces two subjective concepts to the expected utility theory, a personal utility function and a personal probability distribution as perceived by the decision-maker (*ibid.*). The assumption made in the subjective expected utility theory model is often violated, but is considered to be the most satisficing normative approach to decision-making under uncertainty (Fishburn, 1981). Several studies have criticised the use of expected utility on descriptive grounds since it fails to describe observed behaviour in real life situations (Flaten *et al.*, 2005). Because of the limitations in the expected utility theory a more descriptive and behavioural approach is used in this thesis to describe farmers' decision-making under risk and uncertainty.

2.2.2 Behavioural Approach to Risk and Uncertainty

In the behavioural approach a different method is used to measure peoples' attitudes towards risk. It attempts to measure risk attitudes by asking respondents to indicate the level of agreement to a set of statements. Risk perception captures further behavioural aspects and is important for understanding how people understand risk in the behavioural approach. A starting point is that there seems to be no correlation between perceived risk and measurable probabilities of risk (Botterill & Mazur, 2004). From a behavioural approach on decisions under uncertainty there is a greater focus on the relevance of people's subjective judgements (Vasvári, 2015). According to Renn (1992), probabilities and expected values are not the base for the decision-makers' risk judgement, it also seems to be biases in peoples' probability estimations even if quantified values are included, and the context is influencing peoples' risk perception. Since the understanding of risk is multidimensional it cannot be limited to study the products of probabilities and consequences (Renn, 1992). Peoples' response to risk are based on their perceptions rather than the objective and scientific assessment of risk.

When people estimate probabilities of risk they do not make rigorous calculations in accordance with statistical information (Boholm, 1998). Instead of probabilistic calculations people apply a casual or rule-governed approach. To make judgements in situations that involve uncertainty, mental operations, or guidelines, are used by the decision-maker. They simplify complex decisions through heuristic methods due to limitations in knowledge, abilities and time (Slovic *et al.*, 1980; Tversky & Kahneman, 1974). Heuristics explain methods used by the decision-maker to make a decision in complex decision situations. However, it does not include underlying factors that may be of importance to understand individual's decision-making behaviour when facing risk. Tversky and Kahneman (1974) identify these methods as representativeness, availability and adjustments (anchoring). Representativeness means that people use stereotype thinking based on emotions and associations to make judgements of cause and effect in decision situations (*ibid.*). Availability means how easy an event is brought up to mind by the decision-maker, for example people tend to overestimate the probability of dramatic events that is low in frequency and underestimate more common events that are less dramatic and frequent (*ibid.*). This indicates that decision-makers use single events as a guideline for decision-making rather than a large body of statistical evidence. Adjustment, sometimes referred to as anchoring, means that individuals make their estimations based on initial values that are available. The decision-maker adjusts their estimates based on the initial value, even if the available information is obviously an extreme value. In an attempt to further develop Tversky and Kahneman's (1974) findings on decision-making behaviour, Sitkin and Pablo (1992) present a model of underlying factors of importance to individual decision-making. The model is based on previous literature and findings of factors that influence how the decision-maker behave in situations that includes risk and uncertainty. It is an acknowledged model commonly used in the research field of decision-making under risk. The model establishes a solid foundation for what factors that may be of importance in situations that includes risk and uncertainty, therefore it provides a good starting point when investigating farmers' reasoning and behaviour when adopting risk management tools.

2.3 Determinants of Risk Behaviour

Sitkin and Pablo (1992) argue that earlier studies on decision-making behaviour regarding risk have focused on singular determinants of behaviour and therefore do not reflect the complexity of real life. Instead, they developed an alternative model that focuses on the role of risk propensity and risk perception in decision-making behaviour under risk (see figure 4). Risk perception and risk propensities have a direct effect on the decision-makers behaviour when facing a risky situation (Sitkin & Pablo, 1992). The two determinants of risk behaviour are individually influenced by underlying factors that have a direct effect on the determinants and an indirect effect on people's risk behaviour. The model has earlier been tested in a quantitative way to determine the significance in the relationship between the underlying factors and determinants. These studies explain how the factors and determinants interplay and what significance they have for individuals' decision-making behaviour in situations that includes risk (Thompson, 2015; Keil *et al.*, 2000). The results provide insights that can be used to improve individuals' ability to make correct decisions from a risk management perspective. The model has also been used in a similar way to explain farmers' decision-making behaviour when they adopt risk management strategies in general (van Winsen *et al.*, 2016). None of these studies have used a qualitative approach to examine farmers reasoning when they face decision situations that includes risk and uncertainty, and what factors they consider of importance to their assessment of risk management strategies. In their model of determinants of risky behaviour Sitkin and Pablo (1992) focus on larger organisations. Since agricultural firms are

often operated by a single individual (Willock *et al.*, 1999), the variables “top management team homogeneity” and “organisational control system” are not further discussed in this thesis.

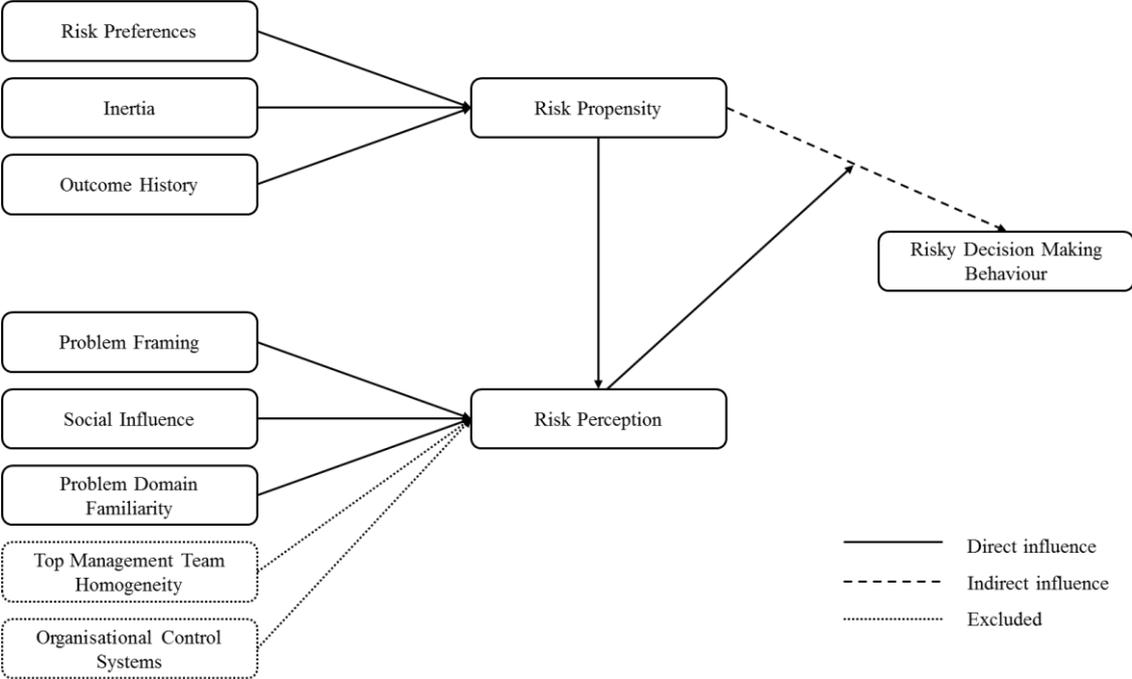


Figure 4. Model of determinants of risk behaviour, own processing based on Sitkin and Pablo (1992) and Sitkin and Weingart (1995).

2.3.1 Risk Propensity

Risk propensity is a term that is connected to the willingness of an individual to take chances with respect to the risk of potential loss. The propensity to take or avoid risks may have an impact on individuals’ decision-making, when they face a decision situation that includes risk and uncertainty (Keil *et al.*, 2000). The personal risk preferences together with the decision-makers’ inertia and the outcome history of prior decisions within the domain affect the individuals’ risk propensity (Sitkin & Pablo, 1992). Risk preferences, inertia, and outcome history combined shapes the farmers risk propensity.

Risk preferences are a general dispositional risk orientation that reflects personal experiences and beliefs (Sitkin & Pablo, 1992). This generates identifiable preferences about how the decision-maker assess and reacts to risk (Slovic, 1972). It is connected to the risk appetite and the fact that some people prefer and others disdain risk. Even though the individuals’ willingness to take risks differ, it is assumed that most farmers, just like people in general, are risk averse and therefore disdain risk (Hardaker, 2004). There is also a gender aspect, research indicates that women are more risk averse than men in decision situations that include economic issues (Charness & Gneezy, 2012). Individuals’ attitude towards risk can also be different over domains and time. Farmers with stronger preferences in the progressive farming category experienced higher volatility in farm income, which indicates that they were unsuccessful in adjusting their behaviour to avoid risk (Hansson & Lagerkvist, 2012). Risk preferences are important for farmers’ decision-making, since risk averse farmers may avoid the decision alternative that will maximise their economic pay-out in the long run, if they believe that the choice expose them to an unacceptable risk of loss.

Inertia implies that both organisations and individuals exhibit routine and habitual ways of handling risky situations (Sitkin & Pablo, 1992). It is related to the risk preferences that tend to persist over time and decisions are assumed to be executed in a predictable way. Therefore, individuals who have been risk averse in the past will continue to act in a cautious way. Past behaviour in a decision situation tend to influence future behaviour in similar situations. People's past decisions are therefore a good predictor of future behaviour (Albarracín & Wyer Jr, 2000), given that the consequence of the past decision was not disastrous (Skinner, 1953). If the decision-maker assumes that the current conditions are equal to the conditions in their earlier decision, they might repeat their behaviour without bothering to verify if that assumption is correct (Taylor, 1975). The phenomenon of repeated decision behaviour is widely discussed in the field of consumer choice theory. Inman and Zeelenberg (2002) state that consumers have two alternatives in decision-making situations, to continue with current strategy of purchase or to select a different strategy. The status quo effect suggests that individuals stick to the initial strategy of choice over time. The decision-maker that chooses to change the status quo decision tend to feel a more instant and powerful regret, than if the same outcome would have been achieved by maintaining the initial strategy (Inman & Zeelenberg, 2002). Therefore, the decision-maker prefers to continue with the status quo strategy.

Outcome history is a characteristic that implies that historical risk-related decisions affect future decisions (Sitkin & Weingart, 1995). When prior risk-seeking actions have been successful the decision-maker will continue to seek risk in domains of gain (Thaler & Johnson, 1990). Osborn and Jackson (1988) make similar findings in the domain of risk-averse actions. In general, if the used strategy in prior decisions has been successful, the decision-maker will be contingent with this strategy in the future (Sitkin & Pablo, 1992). Earlier success that can be associated with the decision-makers' actions may even lead to increasingly risk-averse or risk-seeking behaviour.

Risk propensity and risk perception both appear to have a direct influence on individuals' decision-making, but the determinants also interact with each other (Keil *et al.*, 2000). Risk propensity has a direct effect on the individuals' risk behaviour, but it also is of importance regarding the determinant risk perception (Sitkin & Pablo, 1992). Risk propensity has a mediating role between risky decision-making behaviour, personal traits and risk perception (see figure 4).

2.3.2 Risk Perception

Risk perception is affected by three additional underlying factors beyond risk propensity that connect to the decision-maker's risk behaviour. Problem framing indicates that the decision-maker's risk perception is partially influenced by how the issue is framed (Sitkin & Weingart, 1995), and is a part of the prospect theory presented by Kahneman and Tversky (1979). The decision made by the decision-maker are based on the personal reference point. Decision-makers who believe that they are in a favourable position are more risk averse, than individuals who believe that they are in an unfavourable position. The reason for this difference in risk preferences is the feeling of having a lot to lose or little to lose (*ibid.*). Problem framing also includes a situational aspect. By highlighting the potential loss implied by a decision, an individual is more likely to overestimate the probability of an event (Dutton & Jackson, 1987). The decision-maker is more willing to avoid a loss than to gain an equivalent amount of profit (*ibid.*).

Social influences on risk perception include the fact that individuals gather information from others (Sitkin & Pablo, 1992). Individual values and beliefs may be a reflection of a broader

societal attitude towards uncertainty. In a risky situation this may serve as a guideline for the decision-maker. One aspect of social influence on risk perception is the culture in the context where the individual is operating (Douglas & Wildavsky, 1983). Sitkin and Pablo (1992) discuss organisational behaviour in their model and points out that organisational attitudes toward uncertainty is a reflection of broader societal attitudes. The social and cultural contexts influence the risk an individual subscribes to a hazard, perceived risk partially originates from a socially shared world view.

Problem domain familiarity focuses on the past experiences within the problem domain (Sitkin & Pablo, 1992). Past experience based on familiarity in a domain may affect the decision-maker's risk perception, regardless of historical outcomes. Decision-makers tend to reduce the complexity of a decision through problem solving shortcuts, it is based on learning by experience and leads to standardised responses and routines (Mintzberg *et al.*, 1976). Individuals approach new problems by applying pre-existing solution routines, generated from past experiences. As individuals gain experience in decision-making, they tend to underestimate the current situation and overestimate their own abilities to manage problems (March & Shapira, 1987). A lack of past experience can also cause problem for the decision-makers and influence their perception of risk (Sitkin & Pablo, 1992). A limited knowledge and information base may lead to overreactions when new information is available, this can result in dramatic changes in the decision-makers risk perception.

2.3.3 The Role of Perception and Propensity in Decision Behaviour

Sitkin and Pablo's (1992) model of the determinants of decision behaviour has been further discussed by Sitkin and Weingart (1995) in a study concerning the role of risk propensity and risk perception on risky decision-making behaviour. This study concludes that risk propensity and risk perception work as mediators of antecedent factors on risky decision-making behaviour. The antecedent factors have a direct impact on risk perception and risk propensity, and therefore an indirect effect on the decision behaviour. Sitkin and Pablo (1992) assume that risk preferences, inertia and outcome history affect the decision-makers' risk propensity, they also assume that problem framing, social influence and problem domain familiarity affect the decision-makers' risk perception. Both Sitkin and Weingart (1995) and Sitkin and Pablo (1992) conclude that risk propensity has limited or no direct effect on the decision behaviour, but have an indirect effect due to its significant impact on the decision-makers' risk perception.

3. Method

This chapter presents the methodological approach for this thesis. Firstly, the research design used in the thesis is presented together with a discussion about why this design is considered suitable. Secondly, the chosen course of action is presented together with a reasoning about the quality assurance of the study. Thirdly, a general discussion about the implication of the chosen method is conducted. Finally, the ethical considerations made before, during and after conducting the study is discussed and motivated.

3.1 Research Design

The aim of this study is to investigate underlying factors of risky decision-making behaviour, and their importance for farmers' decision to purchase a crop insurance. It was conducted by examining farmers' crop insurance decision to gain a deeper understanding of their risk behaviour. A qualitative research approach was applied to obtain a deeper understanding of the individual farmer and their unique companies. The qualitative research approach was chosen since the study aims to provide an increased understanding of the behaviour and actions of people (Robson, 2011).

A qualitative research approach is suitable when the main objective of the research is to obtain an understanding of individuals' perspectives in a specific context and real-world settings (Patton, 2005; Golafshani, 2003). This approach is also useful when the researcher aims to investigate the meaning of a social phenomenon, and how this phenomenon is experienced by the people included in the study (Malterud, 2001). Qualitative research is characterised by its aim, which relates to understanding some aspects of social life, and its methods which generate words, rather than numbers, as data for analysis (Bryman & Bell, 2011; Golafshani, 2003). The existence of several parallel realities are taken into account, whereas the quantitative research approach acknowledging one objective reality (Merriam & Nilsson, 1994). Instead of measuring variables, these realities are created through the interpretation of conversations and actions. In this thesis the farmers' stories about their crop insurance decision is used to identify important aspects in their behaviour. The farmers' point of view contribute with information concerning factors of importance in their decision-making behaviour when facing risk and uncertainty. By using a qualitative research approach the researcher has the possibility to emphasise complexity and provide detailed understanding of the specific cases that are studied (Bryman & Bell, 2011). There is some critics against the qualitative research approach due to its limited possibility to make statistical generalisations outside of the specific research context (Robson, 2011; Yin, 2009; Guba & Lincoln, 1994). However, it is still possible to make analytical generalisations by comparing the findings with existing theory (Robson, 2011; Yin, 2009). Even though the study is delimited to a specific region and a smaller number of cases, it can provide an understanding of important aspects in farmers' decision-making under risk and uncertainty in a broader context.

3.2 Course of Action

This section presents the course of action in the thesis. It includes a description of the multiple case study design, how the respondents were selected, the interviewing process, and the analysis procedure of the collected data.

3.2.1 Multiple Case Study

To collect empirical material a case study approach was chosen. A case study is an intensive study of specific units, often a single individual, a group of individuals or a situation, where the goal is to provide findings that can be generalised outside the studied context (Robson, 2011). The Sitkin and Pablo (1992) model is commonly used to estimate and quantify the relation between the underlying factors and determinants of risky decision-making behaviour. Through a qualitative case study it is possible to use the respondents' story to make a thicker description of their actual reasoning in the decision situation, and not only evaluate their behaviour with numbers and statistics based on predetermined hypotheses.

In business research, case studies are a widely used research design. The approach is not only limited to single case studies since it also can include multiple cases (Eisenhardt & Graebner, 2007). Case studies are argued to be a useful tool in preliminary and explorative stages of a research area. As in this thesis, it can also be useful when there is a need for new perspectives on a research topic (Eisenhardt, 1989). Before conducting a case study, it is important to consider if the single or multiple case study approach is most suitable for understanding the phenomenon that is studied. To answer the research question in this thesis, the multiple case study was considered to be the most suitable design. By using the multiple case study it is possible to investigate differences between the selected cases and to replicate findings across these cases (Yin, 2009). With several cases the researchers are given the opportunity to clarify if findings in a single case are valuable or not in a broader context (Eisenhardt, 1991). By identifying patterns and similarities in the respondents' answers, this study can identify which underlying factors in farmer's decision-making behaviour that are commonly expressed to be of importance.

The theories in this thesis were selected through a narrative literature review. A narrative literature review does not follow a systemic procedure with clear distinction between the theory development and data collection (Bryman & Bell, 2011), instead the development of the theories included in the thesis were accumulated both before, during and after the collection of the empirical data. The narrative literature review is used in case study research since it is relevant to understand existing theory within the research topic before starting the data collection (Yin, 2009). This theory development process differ from other types of qualitative study designs, such as grounded theory and ethnography, where a "theoretical" proposition is avoided before data collection (*ibid.*).

To examine existing findings in previous literature a profound review of the literature about crop insurance, risk management and decision-making under uncertainty and risk were made. The findings in these articles led to the detection of topics and theories related to the research question. This sampling method is called "snowballing" which means that findings from one study is used to identify additional references (Ridley, 2012). The literature review was conducted by using databases such as Google Scholar, Primo and the search service at Uppsala University Library.

3.2.2 Selection of Cases

In multiple case studies, the cases are selected where the theory suggest that the same results can be obtained, or where predictable different results can be obtained (Robson, 2011). In case studies where comparisons between cases are made, it is necessary to choose the cases carefully to be able to predict similar or contrasting results based on existing theory (Yin, 2009). In this

thesis a homogenous group of cases was selected, they have similarities in production orientation, farm size and geographical location.

The 13 respondents included in this study were selected with a purposive sampling, made from a larger sample of farmers provided by the insurance company Dina Försäkringar. In purposive sampling, the researcher relies on his or her own judgment when choosing members of the population to participate in the study. It is a non-probability sampling method often used when researchers believe that they can obtain a representative sample by using a sound judgment (Bryman & Bell, 2011). The purposive sampling seeks to identify respondents that hopefully will maximise the depth and richness of the data to address the research question (DiCiccio-Bloom & Crabtree, 2006).

The respondents were selected according to pre-determined criteria relevant to the research objective (Guest *et al.*, 2006). All farmers were cultivating more than 200 hectares of arable land, with crop production as the major part of their operation. The criteria to study farms that cultivate at least 200 hectares of arable land is based on the reasoning concerning the increased importance of economics of scale in a report from the Commission for Increased Competitiveness in Swedish Agriculture (Annerberg, 2015). The study is also geographically delimited to the region of Scania in the southern part of Sweden, which is a region with a high percentage of full time farmers (Karlsson, 2015). All the farmers were also using a crop insurance at the time of the study. Some of the farmers that were selected from the initial sample provided by Dina Försäkringar were excluded since they did not match with the delimitations of this study, or they had a personal connection to one of the authors. Two of the 15 farmers that were initially contacted did not want to participate due to high workload in their businesses.

Existing literature about qualitative research does not mention specific numbers of respondents needed in a non-probabilistic sample. Instead, saturation is stated to be an important determinant for the number of respondents needed (Guest *et al.*, 2006). Saturation is the point where no new information or themes can be observed in the data that is collected. The number of respondents needed to reach saturation in qualitative research are debated in the field of social science. It is argued that the number of respondents should be at least fifteen individual cases, other mean that six to eight respondents are enough to reach a satisfying level of saturation (Guest *et al.*, 2006). This study follows the reasoning by Guest *et al.* (2006), who argues that saturation usually is reached within the first 12 interviews. Therefore, the 13 respondents that were interested in participating were considered enough to reach empirical saturation for the purpose of this study. During data collection was saturation considered to be reached after ten interviews and the additional three interviews were conducted to confirm that no additional information would appear.

3.2.3 Interviews

The empirical material was collected through semi-structured in-depth interviews conducted between the 2nd of November and the 13th of November in 2017. Initially, the farmers were contacted by telephone. The intention of the study was briefly presented and a preliminary time for the interview was scheduled. An email with general information about the study and contact information was also sent to the respondents together with a request to confirm the date for the interview. The interviews were conducted face-to-face with the respondents on their farms, and lasted approximately 30-45 minutes. Before the interview the respondents were introduced to the subject of the study and its context. The farmers were promised that their participation would be treated with anonymity, and that names or farm specific information would be kept

confidential. They were also informed that they had the possibility to refrain from answering a question, or at any time during the interview withdraw their participation.

Collecting empirical material through interviews in qualitative research is preferable due to its flexibility and ability to take human language into consideration (Bryman & Bell, 2011). It provide a more developed and rich set of data than quantitative studies based on statistical measurements. With semi-structured interviews it is possible to approach the respondents differently while still covering the same areas of data collection (Noor, 2008). This gives the respondent the opportunity to freely develop their answers and the researcher can use follow up questions to gain a deeper understanding of the issue (Bryman & Bell, 2011; DiCicco-Bloom & Crabtree, 2006). One of the advantages of the in-depth interview is that there is time for the respondent to further develop their answers without being influenced by the opinions of other respondents. It also gives the researcher the possibility to change the order of the questions and add questions that connect to the respondents' previous answers. When there is a clearly expressed objective in the research the semi-structured interviews is suitable (Bryman & Bell, 2011). This thesis has a clearly expressed objective based on propositions in existing literature. Therefore, semi-structured in-depth interviews were considered as a preferable data collection method.

A semi-structured in-depth interview is a loosely structured interview that makes it possible to dig deeply into the respondents social and personal matters (DiCicco-Bloom & Crabtree, 2006). Semi-structured interviews are based on an interview guide that is prepared prior to the interview, and include questions of open character. The questions in the interview guide used in the study were based on findings in the literature and underlying factors of the determinants for decision-making when facing uncertainty and risk presented in Sitkin and Pablos' model (see appendix 1).

Since the individual risk preferences are difficult to measure solely through open ended questions an additional questionnaire based on a Likert-scale was used. The Likert-scale developed by Likert (1932) is a useful tool to reveal individuals risk preferences. In this study the Likert-scale test presented by Pennings and Garcia (2001) was used, which include seven statements of risk attitudes that is answered by marking the level of agreement or disagreement (see appendix 2). Each statement is answered by marking a scale ranging from -4 to 4, where -4 correspond with the highest level of disagreement and 4 correspond with the highest level of agreement. The risk-neutral score was set to 0 and farmers with a positive average are risk averse and farmers with a negative average are risk seeking. The Likert-scale was used as a complement to the semi-structured interview to triangulate the empirical findings about the underlying factor risk preferences. Methodological triangulation with both qualitative and quantitative measures can be useful if a single method is considered as inadequate (Morse, 1991). Triangulation ensure that the most comprehensive approach is used to solve the research problem (*ibid.*). When methodological triangulations are used, it is important with limited interaction between the datasets during data collection. The datasets should complement each other at the end of the study. In this study, the interviews were conducted first, when the interviews were finished, the farmers were asked to answer the Likert-scale test about risk preferences.

The chosen method with semi-structured interviews worked well during the interviews. The loosely structured interview guide gave the interviewers the possibility to approach the research questions from different angles. Since some of the farmers were more difficult to interview there was a need to ask similar questions at different times of the interview, and ask follow-up questions to encourage the respondents motivate their previous answers. When the farmers had

to think about their crop insurance decision from different perspectives they expressed several reasons that were of importance. Both authors of this thesis have conducted semi-structured interviews before, but since both were new to the research subject it took two interviews to improve the quality of the interviews. Some of the follow-up questions that were asked in the first interviews were included in the interview guide since they were considered to be valuable to get answers essential to the research question. This might have led to that the answers in the first two interviews would have been different if the respondents were interviewed later in the interview process. Another issue that need to be addressed is that the interviews were conducted in Swedish including the written transcript since that was the native language for all the respondents. This improved the respondents' possibilities to express themselves correctly and to provide feedback on the written transcript.

3.2.4 Analysis of Collected Data

The unit of analysis in the study are the farmers' story about the underlying factors that influence the decision to purchase a crop insurance as a risk management tool. This includes the individual farmers' thoughts, feelings and behaviour in their decision-making when they face risk and uncertainty. The data collected in the interviews were transcribed into a written version of each interview, which was a time-consuming process but provided the authors with a version of the data that was easier to overview and analyse. The transcript was translated into English during the preparation of the thesis. This might have led to some central points being misinterpreted to some extent. Since the researchers commonly use the English language in reading and writing the most critical errors have hopefully been eliminated. The transcripts were analysed through thematic analysis which includes the identification of similarities and differences between the cases, to generate patterns in the dataset (Braun & Clarke, 2006). Analysis through thematic coding provide the possibility to identify central and additional underlying factors that affect farmers' decision to purchase a crop insurance. Since qualitative research generates a rich and large set of data, it is necessary to identify the analytic paths to navigate through that richness (Bryman & Bell, 2011).

During the thematic coding general themes in the dataset, which were associated with the research question, were identified and examined. The general themes were identified by grouping labels and findings in the empirical material as initial codes that were of potential interest. Thematic analysis includes six steps with data processing, familiarisation with data, initial coding, searching for themes among initial codes, reviewing themes, defining the main themes, and production of a final report (Braun & Clarke, 2006), see table 2. The six phases listed by Braun and Clarke (2006) were used as a guideline in the coding of the empirical material. The underlying factors in the Sitkin and Pablo (1992) model were used as a starting point to structure the initial codes into main themes. The challenge during the analysis was to code the answers where the respondents did not clearly state their reasons to purchase a crop insurance. This demanded some subjective reasoning to sort the codes into general themes since the respondents used several different expressions to describe the same phenomenon. This was taken into account through an analysis of the context in which the answer was provided to ensure that the code was understood correctly.

Table 2. The six phases of the thematic analysis used in the thesis based on Braun and Clarke (2006)

Phase	Process	Results
1.	The empirical data was read to become familiar with the content with a focus on locating patterns in the interviews.	Primary notes and initial codes.
2.	The amount of initial codes were reduced by labelling and categorising. The meaning of the codes were clarified.	Categorisation to comprehensive codes that were connected to the research questions.
3.	The initial codes were combined to general themes based on the Sitkin and Pablo (1992) model that accurately described the data. Codes that did not fit in the model were identified.	Development of potential additional themes that were further analysed.
4.	An additional review about the interaction between the themes and the theoretical framework. Further development of the theoretical framework to obtain additional knowledge in the research field.	Patterns and themes that accurately describe the content of the data were generated and the theme status quo was introduced to complement the model.
5.	The meaning of the themes and what aspects of the data they capture were defined.	An analysis of how the themes contribute to the understanding of the empirical data was conducted.
6.	Selection of central themes that made a meaningful contribution to the understanding of the research topic.	The results were discussed and main conclusions were formulated.

3.3 Method Discussion

The concepts of reliability and validity are used in qualitative research to discuss and assure the quality (Golafshani, 2003). Reliability is a measure of the possibility to duplicate a study, and to generate similar results at a different time and setting (Drost, 2011). The reliability of a study is a reflection of its stability, consistency and equivalence (Brink, 1991). If the respondent is consistent in the answer of identical questions despite differences in time, there is stability. The respondent's answers on the given topic should also remain concordant due to a well-established issue within the data collection methods, if so there is consistency. Equivalence is tested by concurrent observations of two or more researchers or by using alternative forms of questions with the same meaning within a single interview.

Validity in qualitative research design deals with the quality and trustworthiness of the study (Bryman & Bell, 2011). It is a measure of the accuracy in methodology and presentation, and should explain if the study is capable of examine what it is intended to (Yin, 2009). Validity includes considerations about the view of people who conduct or participate in the study (Creswell & Miller, 2000). The validity in this study was improved by using a homogenous group that aggregated provide empirical data that is representative in a broader context. A homogenous group together with semi-structured interviews gives the researchers' a good understanding of the participants' viewpoints, feelings and thoughts about the studied issue (Johnson, 1997). Other considerations made to improve the validity of the study was to describe and motivate the theories that are relevant to fulfil the aim of the study. Further, a thorough

explanation of the research process, the advantages and disadvantages with the chosen research approach and design is also discussed. The material used for collecting data, i.e. the interview guide, was examined by an expert prior to the interview to reduce ambiguity, leading questions, emotive questions, and stressful questions. All interviews were recorded and transcribed into a written document, this transcript was sent back to the farmer by e-mail to ensure that the collected material was correctly understood and interpreted. This is a technique to triangulate what the respondent told the researcher and ensure that his or her viewpoints are explained accurately. The chosen number of respondents also contribute with a triangulation of individual viewpoints and experiences that can be verified by other respondents (Shenton, 2004). The coding approach is described and the logic behind it is presented so the reader can make his or her own judgements about the quality of the collected data.

3.4 Ethical Considerations

In qualitative research ethics is often associated with the relationship between the researcher and people involved in the study (Given, 2008). It is common to talk about research ethics as considerations concerning the people involved, since there is a potential of harm, stress and other negative consequences for the participants (Robson, 2011). Given (2008) expresses the need to integrate ethics in all decisions made in a research project, from problem formulation to the presentation of results. Ethics can be seen as the evaluation based on an outcome of an action (Vogt & Johnson, 2011). What is ethically wrong does not vary by context or consequences.

It is important to make ethical considerations through the entire process of an interview investigation (Kvale, 2008). The researcher needs to think through all the steps of an interviewing process in advance to identify ethical dilemmas during the process. DiCicco-Bloom & Crabtree (2006) consider four ethical issues related to the interviewing process. First, to gain trust from the participant it is important to reduce the risk of unanticipated harm to the respondent. The respondent needs to feel comfortable with sharing their story. The interviewer must be prepared to provide support if the interview creates undue stress or raise psychological complications. Second, the anonymity for the respondents needs to be maintained, since sensitive information that is shared could jeopardise his or her position in a system (DiCicco-Bloom & Crabtree, 2006). The shared information must remain confidential and protected from those whose interest's conflict with those of the respondent. Third, the researcher needs to effectively inform the respondents about the study and its nature. It is important that the researcher repeatedly during the process gives the interviewee the possibility to reconsider his or her participation (Creswell & Poth, 2017). Fourth, the respondent should not be exploited for personal gain and acknowledging them for their contributions to the success of the study (DiCicco-Bloom & Crabtree, 2006).

To meet the ethical dilemmas related to the study, it is necessary to discuss the researchers' role (Kvale & Brinkmann, 2014). The interviewer's main task is to obtain information and encourage the interviewee to speak (DiCicco-Bloom & Crabtree, 2006). Therefore, the respondents were informed both before and during the interviews that their participation was voluntary, and that they had the possibility to refrain from answering a question, or at any time during the interview withdraw their participation in the study. They were also asked about their approval to record the interviews, in exchange of the possibility to validate a written transcription of the interview. This offer the respondent the opportunity to correct errors in the material if something has been misunderstood (Kvale, 2008), and to make sure that the occurrence of errors in the material was minimised.

There is a risk of biased findings if the researcher reflects personal information that may lead the discussion in an unintended way. Therefore, the researcher have a moral responsibility not to involve personal feelings and commitments in the collection of data through interviews (Kvale & Brinkmann, 2014). The researcher should represent the respondents views as accurate as possible (Given, 2008). The anonymity of the respondent is important, but could potentially interfere with the need to be transparent. Anonymity limits the possibility to describe the surrounding context of the case studied and complicates the validation and replication for other researchers (Kvale & Brinkmann, 2014). Personal information about the respondents is not included in the study to ensure anonymity and confidentiality. Personal information about the respondents where not considered as important for the outcome of the study and are therefore excluded. Through anonymity the possibility to identify the participating respondents was eliminated.

4 Empirical Study

In this chapter the empirical material from the interviews is presented. It starts with a presentation of the cases selected for the study. Each of the 13 cases is presented with a summary of 200-300 characters which include the main content of the interviews. The main points of all the interviews are summarised at the end of the chapter.

4.1 Empirical Background

In total 13 interviews were conducted with farmers in the region of Scania in the southern part of Sweden (see figure 5). All the interviews were conducted on the respondent's farm. The information provided by the respondents is treated anonymously, which means that no names, specific location or farm specific information that makes it possible to identify the farmers are provided. The study focuses on crop farmers cultivating at least 200 hectares of arable land. Some of them are sole proprietorships, others have several employees. The questions asked in the interviews were based on the underlying factors of risk propensity and risk perception, presented in the Sitkin and Pablos' (1992) model of risky decision-making behaviour (see appendix 1).



Figure 5: Location of the Swedish province of Scania by Lapplänning (CC-BY-SA-2.5)

The farmers are all male and have a relatively even distributed age spread between 30-75 years, some have recently started to operate their own farms and others are planning to retire in a couple of years. Most of the respondents have several years of experience in managing a farm, but two respondents have less than three years of experience. The amount of land cultivated by each farmer are minimum 200 hectares, consisting of both land that they own themselves and tenant land. For all the farmers', agriculture and crop production are the main sources of income, but four respondents operates additional businesses areas as a complement to farming. Some examples are off-farm income from contract work with other farmers or non-agricultural companies. One of the farmers is also working part time for a company outside the agricultural sector. Eight of the respondents run their farm businesses as limited companies, some together with other farmers and some individually. All the respondents use a crop rotation scheme that is typical for the region including wheat, barley, rapeseed and sugar beets. Other crops that were included in some of the cases where oats, pees, clover, broad bean and grass seed. Overall the cases form a relatively homogenous group of respondents, typical for the region, with crop farming as their main operation and source of income.

4.2 Presentation of Likert-scale

The Likert-scale developed by Likert (1932) were used to identify the risk preferences of the 13 respondents. It included seven statements concerning the respondents risk appetite, with questions about their preferences both as a person and farm manager. An overview of the statements and the respondents answers are presented in table 3. The respondents answered each statement by marking the level of agreement on a scale with nine values. The highest level of agreement where marked as a four, and the highest level of disagreement as minus four. Respondents with a positive average value was categorised as risk averse and respondents with a negative average value was categorised as risk seeking. Similar to the Likert-scale questionnaire developed by Pennings and Garcia (2001) are statement two, three and four reversed so that a positive score is associated with risk aversion and a negative score is associated with risk seeking.

Table 3: The farmers' score on the Likert-scale test, measuring their risk preferences

STATEMENTS									
1. From the perspective of production, I prefer financial security compared to financial uncertainty									
2. I am willing to take larger production risks and thereby increase my average revenues. ¹									
3. I like to take risks in my crop production. ¹									
4. From a crop production perspective, I am willing to take larger risks in my production and thereby increase my average revenues. ¹									
5. I like "playing it safe"									
6. In my business, I avoid taking risks.									
7. In my business, I prefer security rather than uncertainty.									
ANSWERS									
Statements	1	2	3	4	5	6	7	Average	Risk preference
Respondents									
A	0	-2	-1	-2	0	-1	0	-1.6	Risk Seeking
B	4	1	2	-2	0	-3	2	0.9	Risk Averse
C	4	0	0	2	-3	1	2	1.5	Risk Averse
D	2	-1	-2	-2	0	-2	-1	-1.8	Risk Seeking
E	2	-3	-2	-2	1	-2	1	-1.3	Risk Seeking
F	4	-2	-2	-2	2	3	3	2.2	Risk Averse
G	3	-4	-3	-3	-3	-2	-3	-4.4	Risk Seeking
H	2	-3	0	-1	0	-1	0	-0.8	Risk Seeking
I	2	-1	3	2	2	2	2	3.5	Risk Averse
J	4	-2	-2	-2	1	-2	4	0.5	Risk Averse
K	2	2	1	2	3	0	3	3.9	Risk Averse
L	3	1	4	2	3	0	2	3.8	Risk Averse
M	3	-2	3	0	3	1	3	3.9	Risk Averse

¹ Note that statement 2-4 are recoded before they are presented in table 3.

The results from the Likert-scale test show that eight of the 13 farmers are risk averse in the domain of crop production and production risks. However, several of the respondents pointed out that their answers probably would have been different if they were asked the same question at the time when they first started their business. The data in the Likert-scale was used since risk preferences is difficult to measure with qualitative interviews, and a quantitative measure was useful to triangulate the information gathered during the interviews.

4.3 Presentation of Empirical Data

Respondent A state that the crop insurance is used as one of several strategies to spread the risks of his crop production. The main reason is to reduce the risk of a dramatic loss of revenues in the business, and to avoid ending up in an unnecessary strained financial situation. He is doubtful about the long-term benefits of the crop insurance and stated that *“...if I should be totally honest I am very critical and doubtful if it is worthwhile to have a crop insurance”*. Furthermore, he expressed that it is uncertain if he will continue to use a crop insurance in the future. The decision to insure his crops was made when he started to manage the farm, since then he has continued to use the insurance, he states that *“...it is probably the case of getting stuck in a rut”*. An important part of the decision to continuously participate in the crop insurance scheme is expressed to be the reasoning of Murphy’s Law², and the reasoning that *“...an accident rarely happens alone”*. Crop insurance as a risk management tool is not discussed with other farmers in the region, but he believes that almost every farmer in the sugar beet farming district have a crop insurance. Historically the respondent has used the crop insurance at least once to get compensation for damage in a field of rapeseed caused by hail. He also had a positive experience of insurance in other domains of his business. Overall the respondent believes that cost of having a crop insurance is affordable, and the effect of losing a significant proportion of his sugar beets would be problematic.

Respondent B described the crop insurance as a product that contributes with a feeling of safety. He stated that the crop insurance provides the business with a protection that reduces the impact of a potential loss of income. He also described crop insurance as just a small piece in his overall risk management work. From the beginning the respondent looked at crop insurance as a product that was *“...just a tradition to use”*, but nowadays view it as one piece in the overall risk management work in the company. The farmer states *“by analysing the central revenue streams that the growing of crops provides to the company, the crop insurance provides a protection of that revenue”*. He also explains that his feeling is that the issue of crop insurance is something that is discussed among his farming colleagues, usually when a damage has occurred. The economic compensation from the insurance company and the cost of the insurance always is brought to life in those situations. The respondent is a bit disappointed that crop insurance today is very limited and only include reseeding and hail protection. He describes the product as not enough satisfying and a potential development of the product, so that it includes more potential risks, would definitively be of interest for his business. The respondent thinks that his attitudes towards risk has changed over time as he has learned from his mistakes. When he started the business his willingness to take risks was about the same as today. However, *“I would not say that I am more cautious today when I develop my business, but I am more careful in my evaluation...”*.

Respondent C stated that his farm is located in an area were damages covered by the crop insurance are common, and crop insurance *“is an insurance that should help me to manage the*

² The expression Murphy’s Law means *“...if anything can go wrong, it will.”*

risk of economic losses". He has had crop insurance ever since he started to manage the farm back in the late 1970's. The need to reduce the risk of economic losses were of more importance when he first started to farm for a living, today he feels more resistant to variations in revenues, *"if the company had been newly established it may have been of more importance to hedge for risks"*. Earlier he was a contract farmer of green peas, and the other party in the business agreement demanded that the producers of green peas should have a crop insurance protecting the peas. Historically, the respondent has used the crop insurance to get compensation of damages on his crops, but he also stated that *"...it has been many years since I needed to use it"*, but *"if you have had it, you dare not let it go"*, and *"...if you skip it, you can assure yourself that something happens"*. From an economic perspective the insurance could be questioned, the premiums payed for the insurance exceeds the compensations, *"so it has cost me money, in net value so to speak"*. He estimates that the most farmers in the region use a crop insurance, but crop insurance as a risk management tool is not something that is discussed between colleges and other farmers.

Respondent D has only been a farmer for a couple of years, but there have not been any dramatic changes in the crop production compared to when the previous manager ran the business. He has not experienced any need to use the crop insurance, but states that *"I was strongly advised by my predecessors to have a crop insurance"*. This was also the main reason for his decision to continue with the crop insurance. His predecessors had experienced damages caused by hail in their grass seed and clover and had always used crop insurance as a tool for managing some of the risks in their crop production. Historically, *"it is hailstorms that have damaged entire fields of grass seeds and rapeseeds"*. Personally, he thinks the crop insurance is valuable, *"since there are some risks that you can hedge against in exchange of paying a small premium, and for that reason not get zero revenue"*. The farmers nearby also use crop insurance, and he knows that they have experienced situations where they received compensation from the insurance companies to reseed their crops. The discussion about crop insurance with other farmers is mainly about the price levels of the insurance since many farmers think it is expensive, *"but I also know that it can be high outcomes"*. As a business owner he thinks it is important to consider the fact that you not only insure the profit, but the revenue in a field as well. *"So, it will be very large amounts of money when the insurance should cover a damage"*. The respondent points out that the insurance from an economically perspective have cost him money. *"Probably we have not earned money on it, but at least I think it has been a good deal without calculating so carefully"*.

Respondent D manages the farm together with his father, and he overtook the main responsibility of the business a couple of years ago. He said that the decision to use a crop insurance was made by his father and that he has not needed to make an active decision by himself to have a crop insurance or not, *"... he has always had it"*. He also remembers that his father got compensation for some damages in his production of sugar beets, but that were at least ten years ago. He has always had a crop insurance and the outcome *"...has been good, otherwise I assume that he had not used it"*. Personally, he thinks that the crop insurance makes him feel safe even if there is a risk of unfavourable weather. The respondent mentioned that the decision to use the crop insurance was easy to make, and that it would be harder to make the decision to not use it. *"It is Murphy's Law, then it will happen"*. He also states that the sugar beets are an important crop for the financial performance of his business, and sugar beets are sensitive to perils covered by the crop insurance. Unfavourable weather is one source of risk that he cannot control for himself, and the crop insurance provides him with some protection against unforeseen weather events. Crop insurance is one of few possibilities to get some protection against bad weather. *"If you have 25 hectares of rapeseed and 50 percent of the*

harvest is damaged by a hailstorm. It is hundreds of thousands, you don't even want to think about it". Crop insurance is not discussed with other farmers, but he can remember that some of the neighbours got some compensation a couple of years ago for damages on their sugar beets. The respondent also expressed some positive experiences with insurance in other domains of his business, one example where a damage on the combine harvester.

Respondent F is soon going to retire, and his children will take over the operation of the company. He states that he likes to minimize the exposure to risk as much as possible in his business. *"...I have as a principle when it comes to insurance, and I want to sleep well at nights..."*. He clearly points out that his objective is to minimise the risk exposure in his operation of the business. People in his surrounding have told him that he has to many insurance, but he likes the feeling of being protected if something happens and therefore it is better to have an insurance than to be without. The farm is located in an area with a high frequency of hailstorms, and that is something that is discussed by farmers in the region. The respondent has historically experienced hail damages on his rapeseed production, even if it was a long time ago. *"... On Sunday afternoon it came a hailstorm, and it was nothing left of the rapeseed..."*. Crop insurance among other things has frequently been discussed over the years with other farmers. He believes that is important to get different perspectives on issues related to the financial performance of the business.

Respondent G has been managing his own farm for 20 years. He has had a crop insurance during the majority of his time as a farm manager, but not always. *".. I did not insure my crop for a few years, without any damage as well. Then I bought the crop insurance again when, it was probably in the period when the grain prices went up again"*. The decision to insure his crop were taken in his first year as a farm manager, because *"...you are more vulnerable with a newly started business"*. You are less sensitive to risks when the business has been up and running for a couple of years, *"...it is less risky to take a risk"*. The last time he decided to use a crop insurance, the main reason where the integration of crops that is sensitive to hailstorms in his crop rotation such as rapeseed and clover. The respondent has historically experienced damages caused by hailstorms on both rapeseed and clover. He does not experience that farmers discuss crop insurance as a risk management tool, and he does not know if the farmers nearby use it, but he believes that most of them do. In general, he has a positive experience of insurance in his business, but he also explained that it was too expensive to insure some of the older machines.

Respondent H has been managing his farm for about a decade. He states that he does not remember why he decided to insure his crop, *"...it is something that you just have"*. Historically, he remembers one time when he received compensation for damages covered by the crop insurance. *"...it was when I got crust in recently sown rapeseed"*. He also stated that it is unusual that events that are covered by the insurance occur in the area where his farm is located, but the crop insurance is *"...something you feel like you should have"*. For example, *"...if it hails when the rapeseed is ready to harvest, it is possible that it will damage 50-70 percent of the harvest. Certainly, that will be a lot of money"*. He stated that the main reason for having a crop insurance is that he believes that every farmer has it. At the same time, he mentioned that he is not sure if everyone has it, but at least his father had a crop insurance. *"It is probably a routine, but I would probably not skip it"*. He thinks that the price of the crop insurance is low, relative to the damage that may occur. In general, his experience of using an insurance in other domains of his business is positive. *"I have had the misfortune to use them pretty much lately and it has worked just fine"*.

Respondent I has managed his farm since the late 1970's. He has used the crop insurance ever since he started to manage his own farm. He also mentioned that his father always used crop insurance as a risk management tool when he managed his farm. When he talked about the decision to insure his crops the concept of Murphy's Law was mentioned. "...*Either, you should decide year one that you should not use it, or to use it all the time*". "...*because if you decide to skip it one year, what will happen? Then there will be hail in the rapeseed...*". The respondent has never experienced a damage in his crops that has been covered by the crop insurance, even if there have been damages in his sugar beets that he thinks should have generated compensation from the insurance company. Even if he always has had the crop insurance, he now questions if it is worth to continue to use it. The decision to insure the crop was made in his first year as a farmer, because "*when you are starting a new business, and the company is in a start-up phase, you are more vulnerable*".

Respondent J is not only a crop farmer, he also has sows and slaughter pigs. He states that he never received any compensation from the insurance companies because the damages on his crops have been limited to a small area. Still, "...*you do not dare to stand without the insurance, if the sugar beets would freeze or there will be hail*". Overall, he sees crop insurance as an insurance against disasters that cause damages you cannot afford to pay for by yourself. Crop insurance provides some protection against events that is difficult to manage in other ways. "...*the insurance should cover events that you cannot affect...*". Since he started to manage his current farm a decade ago and have used a crop insurance ever since. Even though he never has encountered weather events that is covered by the insurance personally, he remembers that a hailstorm caused damages on rapeseed on the farm where he grew up. The respondent does not feel that crop insurance is something that is discussed between farmers. Personally, he thinks that the crop insurance "...*is cheap in relation to the risks*". He believes that his attitude towards risk has changed during his time as a farmer, and "...*you are probably more aware of the risks today...*".

Respondent K has been managing his farm since the middle of 1980's, in the beginning he worked more outside the farm but nowadays farming and crop production is the main activity of his business. He has not always used crop insurance as a risk management tool, but estimates that it has been a part of his risk management work for at least 15-20 years. The decision to purchase a crop insurance is a result of growing older, and he believes that his attitude towards risks have changed over time. In the first ten years as a farmer he did not even consider a crop insurance, but then he also had a larger proportion of off farm incomes. Overall, he is doubtful about the need of a crop insurance and expresses that he repeatedly has reflected about if it is necessary. The concept of Murphy's Law was mentioned by the respondent, "...*if you think about skipping it, then one can assume that there will be a hailstorm that year*". The respondent also has experienced damages in one of his fields with clover, and that he was satisfied with the compensation and the way his insurance company handled the case. When the respondent was asked to motivate what was the most important factor for his crop insurance decision he states that "...*it just happened*". Crop insurance is not discussed by farmers in the region according to the respondent, but "...*it seems that everyone has it or at least my colleagues have it*". The crop insurance provides the farmer, as he expressed it, with some protection against catastrophic events beyond his control.

Respondent L has been a farmer, and managed his own farm for about two decades. He questions the crop insurance from an economic perspective, since the insurance premium exceeds the compensation it has generated. "...*you have wondered if you need it, since it is not really cheap*", still the respondent stated that "...*I have always had it*". Overall, he is critical of insurance because they cost him more money than they generate, "...*I can say that I am very*

confused about insurance. It is something that I really question". Historically, he only remembers one time when the crop insurance has generated compensation. At that time his rapeseed and barley got damaged by a hailstorm that hit the northern part of his farm. The main reason for using a crop insurance is that it provides the respondent with financial protection against some of the weather events that are completely beyond his control. The decision to purchase a crop insurance is nothing that the respondent thinks is discussed among farmers, still he believes that most of his neighbours at least have a crop insurance against hail storms. According to the respondent crop insurance is discussed when damages has occurred, mainly to gain some knowledge about the level of compensation in the region.

Respondent M has been managing his current farm for about three decades. Since he started the business he has always used crop insurance as a risk management tool. Historically, he has experienced damages in both sugar beets and rapeseed, mainly it is damages caused by hailstorms in his production of rapeseed. His experience of the crop insurance is positive, and he thinks that the handling of his errands has function well. The respondent thinks that the premiums are expensive, and states that "*...it is an expensive insurance if you look at every single year.*" "*...there are many farmers who say that you should take the money paid for premiums and put them on a bank account instead*". Overall, he thinks that insurance is a useful tool to avoid major economic losses in his business, but he also states that the insurance always seems to be better in the moment you purchase it compared to in the situation when a damage has occurred. He mentioned Murphy's Law as an important reason for his decision to continue to purchase a crop insurance, and the risk of getting a damage on his crop the first year he decides to not use crop insurance. Another reason was that he believes that his farm is in an area with a high frequency of hailstorms. The respondent believes that most of the farmers in the region have a crop insurance, but it is nothing that is discussed between famers.

4.4 Summary of Empirical Data

Some reasoning about the crop insurance decision occurred repeatedly during the interviews. Several respondents stated that they have always used crop insurance as a risk management tool in their business, and that they first purchased it when they started their business. At least six of the respondents felt that they were more vulnerable to fluctuations in the financial performance of the business, and that the room for financial downturns was more limited when the company was newly established. Some of them thought that a crop insurance was something that all farmers in the region had, and they never thought about not purchasing a crop insurance. Others expressed that they did not have to make the decision by themselves since the person that had managed the farm before them had made the decision. Several of the respondents were questioning if it is an economical rational decision to purchase a crop insurance, since they believed that the premiums they paid exceeded the compensation they have received. They expressed that it would probably be a wiser decision to put the insurance premium on a bank account and accumulate the money to be able to cover the costs once the damage occurs. However, it is easy to spend the money on something more urgent at the specific time, and a crop insurance enables that tempting possibility. At the same time, a common reasoning for the decision to continue to use crop insurance was the phenomenon of Murphy's Law and the risk of getting a damage in their crop the year they decided to quit using the crop insurance. Nearly all the respondents have historically experienced damages caused by bad weather in their crop production, some of them more than once. Most of the respondents did not talk about the decision to insure their crops with other farmers, and stated that most of the farmers in the region had it, or at least they thought that all the other farmers had it as well. Another common factor influencing the crop insurance decision was that the insurance is the only available risk

management tool that can help the farmers to mitigate the effect of bad weather conditions. Although it generates limited protection, the respondents expressed that it felt good to have done what they can to protect themselves from an economic backlash.

5 Results

In this chapter the empirical results are categorised and presented in main themes based on Sitkin and Pablos' (1992) model of risky decision-making behaviour. In addition to the factors in Sitkin and Pablos' (1992) model, the underlying factor of status quo is introduced to complement the model.

5.1. Risk Preferences

Risk preferences reflects the respondents personal experiences and beliefs (Sitkin & Pablo, 1992). These preferences explain how the decision-maker assesses and reacts to risks (Slovic, 1972). The fact that all of the farmers have chosen to purchase a crop insurance implies that they are risk averse in that specific decision. During the interviews nine of the 13 farmers explicitly expressed the feeling of safety as an important aspect of the crop insurance decision. Some of the respondents also implied that their attitude towards risk in general has changed over time, but in what way their risk attitude had changed seems to differ. Some of the respondents talked about a higher level of risk aversion when they first started to manage their own business, because their business was less stable. Other mentioned that they have a higher level of risk aversion at the time of the interview since they have experienced the effect of risk taking during their time as a farm manager, and that they now are more competent in evaluating the potential outcomes. One interesting aspect of the result is that the older farmers with greater experience of managing a farm, experience themselves as more risk averse than the farmers of younger age and less experience in managing a farm.

The results in the risk preference test show that eight of the 13 respondents can be defined as risk averse in the domain of production risk, and therefore disdain risks in their operation of the farm. In the test all farmers except one, answered that they prefer a situation with economic certainty rather than a situation with economic uncertainty. A majority of the farmers also expressed that they prefer safety in the operation of their business enterprise. According to the Likert-scale test, eight of the 13 farmers conduct the crop insurance decision in compliance with their risk preferences in the domain of production risks. The farmers who qualify as risk seeking conduct a decision that contradicts their result in the Likert-scale test. A possible reason could be that crop insurance allows them to take greater risks in other risk-domains.

5.2. Inertia

Inertia implies that organisations and individuals handle decision-making in risky situations in a routine and habitual way. This is related to the decision-maker's preferences and that decisions are assumed to be executed in a predictable manner (Sitkin & Pablo, 1992). Nine of the 13 respondents implied that the decision to continue to purchase a crop insurance is some kind of routine. Common expressions was, it is a routine, it is a tradition, it is just something that has kept on going, its just something that happens, or it is something that you should have. The phenomenon of inertia was usually brought to mind early in the interviews, often when the farmers were asked to specify the main reason for their decision to insure their crops. In general, the routine is mentioned as an explanation for their decision to continue to use crop insurance over time. The farmers receive information about the annual renewal of the crop insurance, where they are encouraged to provide information about the crops, and amount of hectares that are cultivated for each crop. Inertia was also mentioned in four of the interviews as important for the respondents initial decision to use crop insurance as a risk management

tool. The farmers mentioned that their predecessors, when they managed the farm, used a crop insurance as well.

5.3 Status Quo

Some of the initial codes from the empirical material did not fit under the themes presented by Sitkin and Pablo (1992). These codes expressed an unwillingness to terminate the crop insurance and thereby change the current strategy. Therefore, the status quo theme was added to complement the themes in the Sitkin and Pablo (1992) model. In a situation of repeated decisions, the status quo effect suggests that the decision-maker stick to their initial strategy. Decision-makers that change strategy tend to feel more instant and powerful regret than if the same outcome is achieved by maintaining the initial strategy (Inman & Zeelenberg, 2002). Five of the respondents started a reasoning about Murphy's Law when they were asked about their decision to repeatedly purchase crop insurance. A common way of expressing it was that they do not dare to terminate their participation in the private crop insurance scheme after the initial decision to insure their crops. The risk of being exposed to a damage in the crop production the first years after they decide to not participate was perceived as intimidating. Therefore, they have decided to continue with the crop insurance every year and by doing so maintain the status quo strategy.

At least eight of the farmers expressed in that the premiums of the crop insurance, like every insurance product, exceeds the financial compensation they have received throughout the years. Some of them expressed that it probably would be a wiser decision to place money spent on crop insurance premiums on a private saving account instead. With that strategy would the accumulated savings cover for a crop damage when it occurs. However, they also expressed the potential risk that those savings probably would be invested in other business projects instead. When the insurance premium is paid the respondents feel that they have done what is possible to protect their business and income from weather events beyond their control. They justify a strategy that they believe is economically questionable in a long-term perspective by highlighting the potential short-term impact on their crop production.

5.4 Outcome History

Outcome history implies that historical risk-related decisions affect future decisions conducted by the individual (Sitkin & Weingart, 1995). If the strategy used in prior decisions has been successful, the decision-maker prefer to continue with the same strategy in the future (Sitkin & Pablo, 1992). Seven of the farmers express that they have had a damage in their crop production that was covered by the insurance company, i.e. they received compensation for revenue losses or increased costs generated by weather events. Four of these respondents have experienced more than one damage on their crops that has generated compensation from the insurance company. One of the respondents' mention that he historically has experienced a damage that he was not compensated for, even though he personally thought that he should have been compensated. The strategy has been successful to some extent for the farmers who have purchased a crop insurance and received financial compensation due to weather damages in their crop production. Due to the insurance decision they did not end up in a situation with stressed liquidity during the specific year. The farmers clarified that crop insurance has not contributed positively to the company's profitability throughout the period, but it has helped them to reduce the risk of stressed liquidity for a shorter period of time.

5.5 Problem Framing

The individuals perception of risk is influenced by how the issue is framed (Sitkin & Weingart, 1995). Decision-makers base their decisions on their reference point (Kahneman & Tversky, 1979), and current situation (Dutton & Jackson, 1987). When the potential of losses is highlighted the individual is likely to overestimate the probability of an events occurrence. Seven of the 13 respondents discuss crop insurance as a risk management tool that protects their business from financial backlashes. Recurrent expression during the interviews was the risk of additional costs, revenue losses, or liquidity crisis. Crop insurance is also described as a risk management tool that offers protection from catastrophic events and negative financial outcomes beyond their personal control. One of the respondents framed the potential of crop insurance in a different way, he focused on the possibility to secure a satisfying level of revenues to the business in case of unexpected weather events. Some of the respondents stated that the situational aspect is of importance as well and that the incentives to purchase a crop insurance increased when the number of hectares cultivated increased. Others implied that they experienced that crop insurance felt more relevant when the contribution from the crop production to the household income increased.

5.6 Social Influence

An individual's perception of risk is influenced by other people, and people gather information from their social network. The individuals values and beliefs is a reflection of attitudes towards uncertainties in the society, and this may serve as a guideline for the decision-maker in a decision situation (Sitkin & Pablo, 1992). Seven of the respondents felt that crop insurance as a risk management tool is not actively discussed by farmers in their surrounding. Three of the respondents still believed that crop insurance is discussed in relation to periods when there has been a damages on crops in their area. The main topic of discussion is then the level of financial compensation generated from the insurance company, and the total value of the crops that have been damaged. However, one of the farmers actively discuss general risk management strategies, including the decision to purchase a crop insurance, with his colleges. Six of the respondents express that most of the farmers have a crop insurance, or at least they bealive that most colleges have it, even if they are not totally sure. Another aspect of the social influence was mentioned by four of the respondents, who stated that their predecessors had used crop insurance as well. The decision made by the predecessor was of some importance for their their own decision to insure their crops. One of the respondent's answer differ from the majority and he claimed that the advice to purchase a crop insurance from his predecessors were the main reason that he bought the crop insurance the first time.

5.7 Problem Domain Familiarity

Problem domain familiarity focuses on past experience in the problem domain, which may influence the decision-makers perception regardless of historical outcomes (Sitkin & Pablo, 1992). Complex decisions are simplified through problem solving shortcuts, based on learning by experience and the development of standardised responses and routines (Mintzberg *et al.*, 1976). Some of the respondents have experienced damages on their crops, which has not led to compensation from the insurance company. They state that weather events often are impossible to foresee and manage, and that the farm business often is a fight against unpredictable weather. Crop insurance is one of few available risk management tools that can protect their crop production from economic backlashes caused by unpredictable weather. Despite the fact that

the perils included in the crop insurance are limited to hail damages and reseeded. Several of the farmers have experienced times with extreme weather such as drought and heavy rainfalls, with severe impact on the output in their crop production. Even if crop insurance does not cover damages caused by droughts and heavy rainfalls, five of the respondents think that crop insurance is useful to minimise the overall exposure to weather events. In general, when crop insurance is discussed the farmers provide examples of years when they felt that the weather had negative impact on their business, also perils that is not included in the in the crop insurance. Three of the respondents express that they have positive experiences from insurance in other domains, for example damages on their machinery or farm buildings.

5.8 Summary of Results

The underlying factors discussed previously in this chapter are summarised and visualised in figure 6. In this model are the codes behind the underlying factors presented. The letter N represent the number of the farmers who elicited the code in their description of the factors important to the crop insurance decision. The number of N is also visualised by the thickness of the arrows that represents how frequently the codes are mentioned by the 13 farmers included in the study. The value of N between the underlying factors and the determinants is the summarised value of the codes. The value of N indicates how important each of the underlying factors are for the farmers' crop insurance decision. The model in figure 6 serves as a starting point in the discussion of the results that follows in the next chapter.

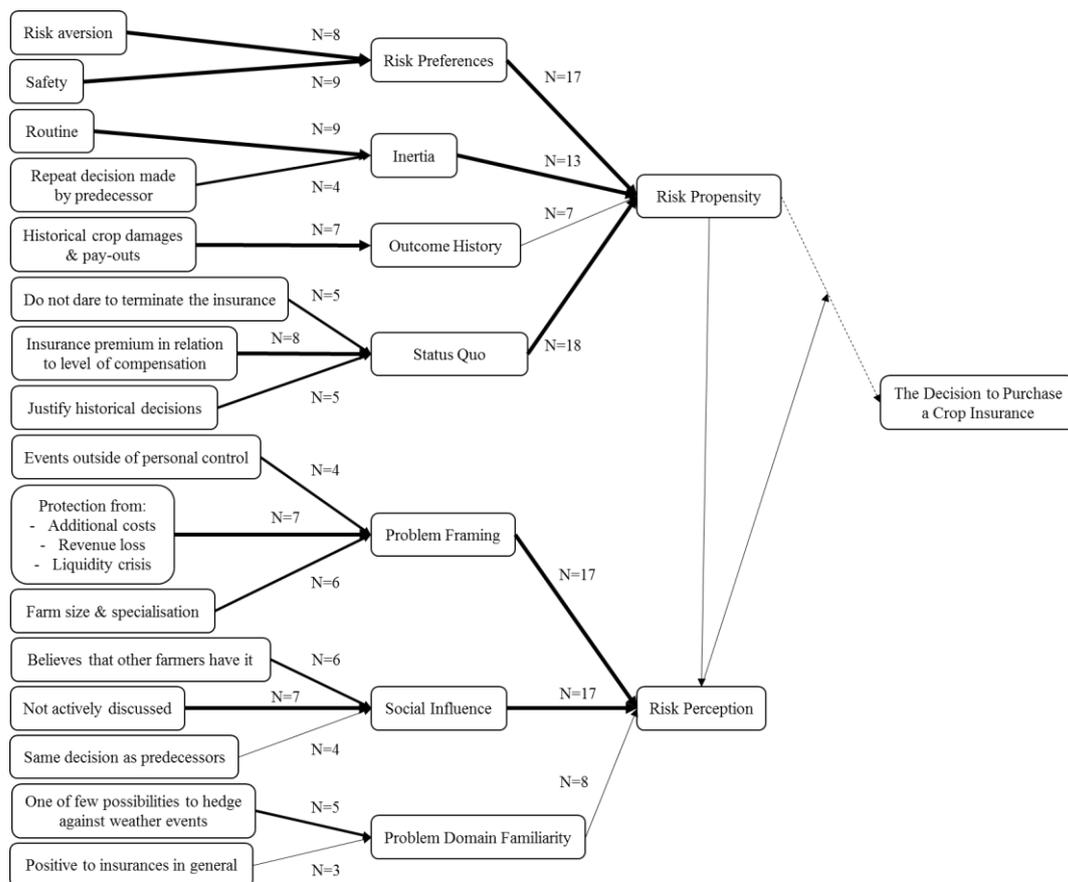


Figure 6: Presentation of the codes included in the underlying factors based on the empirical findings.

6 Discussion and Conclusion

In this chapter the results from chapter five are further discussed together with the main theories presented in chapter two. The purpose is to obtain a deeper understanding of the results and their relation to previous literature and findings. At the end of this chapter, the conclusions together with suggestions about further research are presented.

6.1 Crop Insurance and Decision-making Behaviour

The traditional theory of economic decision-making under risk and uncertainty assumes that the decision-maker conduct the decision that maximises his or her utility (Einhorn & Hogarth, 1981). To be able to make the decision that maximises the utility the individual is assumed to be completely informed, infinitely sensitive and completely rational (Edwards, 1954). The results of this study imply that the farmers understand that the insurance decision from an expected utility perspective probably is irrational. They know that the premiums paid for the crop insurance in a long-term perspective will exceed the potential compensation from the insurance company. Still, crop insurance is perceived as valuable due to its possibility to restrain the negative economic effect of a single weather event in a short period of time. This is similar to the reasoning by Flaten *et al.* (2005) about the limited power in the expected utility theory to explain farmers' risk behaviour in real world settings.

All economic decision that include risk and uncertainty involve a trade-off between risk and potential return (March & Shapira, 1987). Regarding crop insurance, the idea is to reduce the risk of significant revenue losses in the firm, and to hedge against a worst-case scenario. When the decision-maker estimates the probabilities of the risks they encounter, they do not make rigour calculations based on statistical information (Boholm, 1998). This is confirmed by the farmers included in the study. When estimating the probabilities of weather events that is covered by the insurance feelings is of importance, and they do not conduct detailed calculations based on available statistical data. Many of the farmers also points out that they do not know the exact premium they pay for crop insurance, instead they make qualified estimations. This is similar to Renn (1992) findings, suggesting that individuals' risk responses are based on perceptions rather than objective and rigorous assessment of potential risks. Therefore, the expected utility theory is considered to be of limited value to evaluate farmers' crop insurance decision.

When the decision to purchase crop insurance as a risk management tool is discussed the farmers draw on historical events to provide examples of the potential impact of unforeseen weather events. The examples were often weather events that had affected either themselves or a person in their social network. This is similar to the mental operations discussed by Tversky and Kahneman (1974) as decision-making heuristics. The fact that the farmers relatively easily manage to give examples of situations where the crop insurance had been useful is a demonstration of the heuristic method named availability. The respondents use a few specific events as a guideline in their future decision-making. It is also relatively easy for the farmers to visualise the potential risks of weather events, and the cause and effect relationship between unfavourable weather and its effect on the financial performance of their business. Tversky and Kahneman (1974) define this heuristic as representativeness, meaning that decision-makers use emotions and feelings to make judgement of cause and effect in decision situations. The results in this thesis show that the farmers use heuristic decision-making methods to make the crop

insurance decision less complex, and to compensate for the lack of statistical knowledge within the domain.

6.2 Crop Insurance and Risk Propensity

The results show that a majority (62 percent) of the farmers that purchase a crop insurance as a risk management tool are risk averse in the domain of production risk, according to the Likert-scale test results. According to Sitkin and Pablos' (1992) model of determinants of risk behaviour, risk preference is an important factor for the determinant risk propensity. The farmers value the feeling of safety in their enterprise, and are only willing to take production risks that can lead to limited negative impact on the financial performance of their business. This is similar to Hardaker (2004) statement that most farmers are risk averse and therefore disdain risks. It can also be discussed from the perspective of Hansson and Lagerkvist (2012) that farmers risk attitudes are different depending on the risk-domain. When it comes to production risks, a majority of the farmers' who purchase a crop insurance seems to be risk averse based on the empirical findings generated from this study.

Another underlying factor for the determinant of risk propensity is inertia, also referred to as routine and standard responses. Based on the study this underlying factor seems to be of major importance for the farmers' crop insurance decision, but is of less importance for the initial decision. There are differences in the farmers' reasoning and motives whether they discuss the initial decision to purchase a crop insurance or the continued decision. The initial decision is motivated by other underlying factors than inertia by the farmers, however in terms of the repeated crop insurance decision the importance of inertia seems to increase. The results in this study suggests that the decision to continue to purchase a crop insurance is a routine response, and is executed in a predictable manner, similar to what is described in the Sitkin and Pablos' (1992) model.

The routine response is not the only underlying factor of importance to farmers' repeated decision to purchase a crop insurance. In the consumer choice theory, repeated decisions is motivated by a wish from the individual to maintain the status quo (Inman & Zeelenberg, 2002). The farmers seem to stick to their initial choice and expresses an unwillingness to change that strategy. This is not solely an expression of routine and habit as in the case of inertia. Instead, there is a lock-in effect since the decision-maker who changes strategy tend to feel more instant and powerful regret even if the same outcome is achieved.

The factor of outcome history does not seem to be of great importance in the decision to purchase a crop insurance. Though, when the farmers have experienced a damage in their crop production and it has been covered by the insurance company, they are more willing to talk about the benefits of crop insurance as a risk management tool. The farmers talk about historical events, but they do not specify it as a factor of major importance to their decision. Osborn and Jackson (1988) states that if strategy that has been successful in the past, the decision-maker will continue with the same strategy in the future. Even though the farmers do not explicitly mention historical events as one of the most important factor they indicate that it had some influence on their decision. It is possible that the factor of outcome history is of greater importance in the years that follow a damage on their crop, but its influence decreases as the time from the damage increase. This could be the case since the respondents' that have had a damage state that it was many years ago.

6.3 Crop Insurance and Risk Perception

From a personal reference point perspective, the respondents framed the issue differently depending on the current economic situation of their business. In the start-up phase the farmers felt that they were more sensitive to variations in revenues, since the business were in a financially stressed situation. Because of the financially stressed situation the company is less prepared to withstand a short period of weak liquidity due to the absence of accumulated financial assets. When the amount of arable land increase, the monetary value at risk also increase, the incentive to continue purchasing a crop insurance therefore changes from the initial decision. With larger amounts of arable land, the monetary value of each specific crop increases. This can be linked to the findings of Kahneman and Tversky (1979), and that people who believe that they have a lot to lose are more risk averse. Therefore, those farmers whose household income is highly dependent on crop production are more likely to disdain production risks.

From a situational perspective, the farmers highlighted that crop insurance protects them from a loss of revenues and additional costs caused by weather events beyond their control. Even though crop insurance cover a limited number of perils it is viewed as a useful tool to minimise the farmers overall exposure to production risks. The main focus is to protect against potential financial losses rather than to ensure a certain level of revenues. According to Dutton and Jackson (1987) decision-makers tend to overestimate the likelihood of an event if they highlight the potential losses. The decision-makers are also more eager to avoid losses rather than to obtain an equivalent amount of gain. The results in this study confirm this theory, since the farmers state that they have had few damages throughout the years, but that they are aware of the potential consequences of one single weather event. The farmers are more willing to distribute a smaller amount of the cost on several years rather than a larger cost one single year. Crop insurance is framed as a protection from major revenue losses a specific year, which seems to be of importance for the farmers who choose to purchase a crop insurance.

The results show that crop insurance as a risk management tool is sporadically, but not actively discussed by the farmers in the study. However, many of the farmers believes that colleagues in the surrounding areas also have a crop insurance. The farmers seem to make a decision that they believe is similar to other farmers within the same context. Some of the farmers describe that the initial decision to purchase a crop insurance was influenced by their predecessor. This is consistent with Sitkin and Pablos' (1992) reasoning about the power of information provided by others and the decision-maker's personal values and beliefs. The information gathered from the social network is not as thorough as expected in the farmers' decision behaviour, instead the personal beliefs are more prevalent.

The Swedish crop insurance scheme has historically been more extensive with a governmental involvement, compared to today's private market solution. Many of the farmers perceive that the possibilities to protect their crop production against weather uncertainties are limited. In general, when crop insurance is discussed the farmers provide examples of years when they felt that the weather had negative impact on their business, also perils that is not included in the crop insurance. The farmers' perception of risk may have been affected if the farmers have experienced a crop damage in the past, regardless if they have received economic compensation or not. It is easy to imagine situations when the insurance could have been useful, and the farmers could use this as a base for cognitive shortcuts in their current evaluation of the insurance product.

The use of cognitive shortcuts are described by Mintzberg *et al.* (1976), who state that pre-existing solutions generated from past experiences is common to apply when decision-makers conduct decisions in business organisations. Farmers who find insurance as a good way of managing risk in other domains might therefore use this experience as a foundation in their decision to purchase a crop insurance. The farmers whose predecessors had the insurance might have had a great impact on the respondents' initial decision to purchase a crop insurance. The lack of past experiences within the domain might lead to a decision where the outcome is not completely evaluated in advance, and the decision is executed through problem solving shortcuts (Mintzberg *et al.*, 1976).

6.4 Implications of the Study

In this study a reasoning of crop farmers' behaviour in the crop insurance decision is conducted. The empirical material contributes with an understanding of the decision-making behaviour, and the underlying factors that seems to be of importance for farmers' crop insurance decision in the studied context.

In the farmers' initial decision to purchase a private crop insurance the underlying factors risk preference, social influence and problem framing is most important. First, the farmers that use a crop insurance are according to this study risk averse in the domain of production risks, and therefore disdain risks within this specific domain. Second, social influence is also of importance since the farmers learn and adopt from their predecessors combined with a personal belief that other colleges also have a crop insurance. Even if the decision is not actively discussed with colleges the farmers have a feeling that most of the farmers in their surrounding also have a crop insurance. Third, the initial decision to purchase a crop insurance are often made when the business is in a financially stressed situation, such as the start-up phase. In that situation the farm managers are willing to take more actions to avoid financial backlashes.

In this study, the continued decision to purchase a crop insurance the underlying factors of inertia, social influence and status quo are of importance for the farmers' behaviour. First, the farmers state that they execute the yearly decision as a routine, without conducting a deeper evaluation of the current situation. Second, the farmer believes that most of their colleges has a crop insurance, since the risk management tool is discussed when damages on crops has occurred in their nearest surrounding. Third, the study complements Sitkin and Pablos' (1992) model of determinants for risky decision-making with an additional underlying factor. The factor of status quo includes a willingness to continue with the initial strategy rather than to reevaluate and change the decision. The farmers state that if there is a probability that a damage can happen, it will happen. When the first decision to purchase a crop insurance has been made, the farmers express an unwillingness to terminate the insurance, with the reasoning that it is wiser to continue with the initial decision.

Earlier studies have through a quantitative approach studied farmers perception of and responses to risk to understand their risk behaviour and adoption of risk management strategies (Flaten *et al.*, 2005). Several studies use a quantitative approach to analyse the determinants of risk behaviour and its connection to the implementation of risk management strategies (van Winsen *et al.*, 2016; Flaten *et al.*, 2005; Koesling *et al.*, 2004; Meuwissen *et al.*, 2001). The study contributes with detailed empirical findings about the underlying factors that are of importance to the determinants of risk behaviour that have been located in earlier studies. By applying the Sitkin and Pablo (1992) model of decision-making behaviour when facing risk and uncertainty this study complements earlier studies about farmers' implementation of risk

management strategies. The study especially provide knowledge about farmers' behaviour when integrating the private crop insurance as tool to manage production risks. It can also provide knowledge about farmers' decision-making behaviour when they decide to adopt risk management tools in general.

The outcome of the study may be affected by the context studied, and it could be differences in the outcome if the context is different. One important aspect is the differences in crop rotation and weather conditions between regions. The study only includes farmers that uses a crop insurance already, but it is likely that the decision-making behaviour is similar when the farmer decides to not use a crop insurance. There is also a gender aspect that may have influenced the outcome of the study since all the farmers included are males. The reason for only include male farmers is that the original sample that was available included only a limited number of females, and none of the female farmers met the delimitations made for this study. All of these aspects may have influenced the study and it could be of importance to consider when interpreting the results.

6.5 Conclusions

The aim of this study is to investigate underlying factors of risky decision-making behaviour, and their importance for farmers' decision to purchase a crop insurance. This is studied in the context of crop farmers in the region of Scania in the southern part of Sweden. The outcome of the study shows that there are several factors that are of importance for the farmers' decision to purchase a private crop insurance as a risk management tool.

The underlying factors of importance seems to differ depending on if the farmers talk about their initial or continued decision to purchase the crop insurance one year after another. In the initial decision to purchase a private crop insurance the underlying factors of risk preferences, social influence and problem framing is of most importance. For the continued decision the underlying factors of inertia, status quo and social influence is of most importance. The farmers make a more profound evaluation based on the current situation of the business and personal values before conducting the initial decision. After that, routine and habits seems to gain importance in farmers' decision-making behaviour. There is also a willingness to continue with the initial strategy rather than to reevaluate and change.

The study focus on farmers who have made the decision to purchase crop insurance as a risk management tool. The findings are mainly applicable in a similar context, but could also contribute with additional knowledge about farmers' decision-making behaviour in a broader context. The findings suggest that the initial decision is of importance for farmers who have decided to purchase a crop insurance, this could also be of potential value to evaluate the behaviour of farmers who made the initial decision to not purchase a crop insurance.

From a practical perspective these findings could be of interest for both the farmers and agricultural advisors. From the farmers perspective it could be of interest to understand their behaviour when executing risk management decisions to improve the risk management work in their business. These findings might be valuable for insurance advisors to understand individuals' behaviour when discussing other sorts of insurance products with farmers. Furthermore, the underlying factors of importance when farmers adopt risk management tools could also be valuable for agricultural advisors in other contexts to improve their advisory in farm risk management.

6.6 Future Research

The study is limited to the southern part of Sweden, and the region of Scania. The conditions in Scania are different compared to other important crop production regions in the country. For example, the crop rotation in Scania have a larger amount of crops such as sugar beets and rapeseed. These crops are according to the farmers in the study more sensitive to perils that are included in the private crop insurance scheme. Due to the difference in crop rotation, it would be of interest to test if the results of the study are replicable other crop production regions in Sweden. There is also research that implies that individual's risk preferences differs between genders (Charness & Gneezy, 2012). Since all farmers in this study are male it would be of interest to examine if the findings are similar in a respondent group with only females, or that includes both females and males.

The findings in the study are limited to the underlying factors of risk propensity and risk perception in the crop insurance decision. Therefore, it would be of interest to test if the same underlying factors are considered to be of importance in other decision situations including risk and uncertainty. Since the study do not statistically test the strength and impact of the determinants risk propensity and risk perception, it could be of interest to repeat the study to measure the interaction between the two determinants in the farmers' crop insurance decision.

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Appendix 1

Interview guide

Presentation of who we are and the purpose of the study. The respondents were asked for their approval to record the interview and informed that they would be offered the possibility to read and correct a written transcript. The respondents were also informed that their participation was voluntary, and that the thesis is published on the Swedish University of Agriculture's public website.

Background questions

- *Can you please tell us about yourself? For example, age, number of years as a farm manager and education level, things that you find interesting?*
- *Can you please tell us about your business?*
- *Do you have a crop insurance today? If so, for how long have you used it?*
- *Is the crop insurance something that you always purchased during your time as a farm manager?*

Questions

- *What does the crop insurance mean to you, and how does it contribute to your business?*
- *Do you think the crop insurance has been a useful risk management tool? If so, please motivate. If not, please motivate.*
- *Have you used the crop insurance during your time as a farm manager? If that is the case, please explain how often and what type of damage.*
- *How has the crop insurance functioned as a risk management tool in the occurrence of a damage?*
- *If you think about your decision to purchase a crop insurance, what do you consider to be the most important factor in your crop insurance decision?*
- *Why do you think the crop insurance is an interesting product to your business, and how in what way is it useful to your business?*
- *Do you have any knowledge about if it is common that other farmers in the region purchase a crop insurance?*
- *Is the crop insurance something that is discussed among colleagues/farmers? If so, in what way is it discussed? If not, why do you think it's not discussed?*
- *Do you see the crop insurance as a way of protecting you against revenue losses due to reduced production output, or as a way of stabilising the revenue levels in your business?*
- *How would you describe the weather conditions today compared to earlier in your career as a farm manager?*
- *Is your attitude towards risk been consistent over time, or has it changed during your time as a farm manager? If so, please motivate? If not, please motivate?*
- *Do you manage risks in any other way than through a crop insurance in your business? For example, price hedging, production diversification?*
- *What is your opinion about insurance in general, other than the crop insurance?*
- *In what way could the private crop insurance products in Sweden be further developed?*

- *Do you see yourself as a person who reflects on potential risk in forehand, or are you a person who respond to risks when you face them? Can you motivate your answer?*

Appendix 2

Likert- Scale test of risk preferences

Please mark how well these statements correspond to your personal perception.

1. *From the perspective of production, I prefer financial security compared to financial uncertainty*

-4	-3	-2	-1	0	1	2	3	4	
Totally disagree.									Totally agree.

2. *I am willing to take larger production risks and thereby increase my average revenues.*

-4	-3	-2	-1	0	1	2	3	4	
Totally disagree.									Totally agree.

3. *I like to take risks in my crop production.*

-4	-3	-2	-1	0	1	2	3	4	
Totally disagree.									Totally agree.

4. *From a crop production perspective, I am willing to take larger risks in my production and thereby increase my average revenues.*

-4	-3	-2	-1	0	1	2	3	4	
Totally disagree.									Totally agree.

5. *I like "playing it safe"*

-4	-3	-2	-1	0	1	2	3	4	
Totally disagree.									Totally agree.

6. *In my business, I avoid taking risks.*

-4	-3	-2	-1	0	1	2	3	4	
Totally disagree.									Totally agree.

7. *In my business, I prefer security rather than uncertainty.*

-4	-3	-2	-1	0	1	2	3	4	
Totally disagree.									Totally agree.