



# **Master's degree thesis**

**LOG950 Logistics**

**Economic sustainability for local food producers: A case study of Norway.**

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## **Preface and acknowledgements.**

This master's thesis is the last requirement and evaluation for Molde University College's two-year Master of Science in Logistics programme. The research was conducted in the period December 2022 to May 2023.

Throughout this thesis I have gained further insight in the local food industry in Norway- from a Supply Chain Management perspective. In addition, I have gained new knowledge about Partial least squares structural equation modeling, and the use of SmartPLS software for this purpose. This thesis process has been both valuable and interesting, but also at times challenging.

I want to express my gratitude to my supervisor Berit Irene Helgheim, for all the valuable guidance, support, and motivation when needed. Without, this master's thesis would not have come to be in the way it is.

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Additionally, I want to say thank you to all the participants in this study, for their time and participation. Both for the questionnaire and for the interviews.

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## **Abstract**

This study aimed to investigate local food producers' economic sustainability. To do so, I investigated the impact of the following six variables: external and internal barriers, the number of economic operators' producers have in their supply chain, the imbalance of power in the local food industry, number of distribution options, and waste at production.

The investigation was based upon a convergent mixed method, combining questionnaire and interviews. The data was collected using a self-complete questionnaire answered by 57 local food producers across Norway, and with four semi-structured interviews with professionals in the Norwegian food industry.

The quantitative data was analysed with the use of Partial least squares structural equation modeling (PLS-SEM), and the qualitative data has been analysed using a thematical analysis. The overall research area in this study was investigated from eight hypotheses derived from the literature, covering the six variables and the economic sustainability.

The quantitative study statistically confirmed three out of eight hypotheses. These three showed that when the number of economic operators in the supply chain increases, producers' position to imbalance in the sales channels also increases. In addition, the imbalance of power in the sales channels has a negative effect on economic sustainability, and external barriers have a negative effect on the imbalance of power in the sales channels. The interviews, however, supported seven of the hypotheses, though four of which were not significantly supported.

## List of Abbreviations

GFS	Global Food Systems
LFSC	Local Food Supply Chain
SCM	Supply Chain Management
SC	Supply Chain
VC	Value Chain
FSCM	Food Supply Chain Management
FSC	Food Supply Chain
LFS	Local Food Systems
SFSC	Short Food Supply Chain
TFSC	Traditional Food Supply Chains
SEM	Structural Equation Modeling
PLS SEM	Partial least squares structural equation modeling
CB SEM	Covariance based Structural Equation Modeling
AVE	Average Variance Extract
HTMT	Heterotrait-Monotrait ratio of correlations

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## 1.0 Introduction

Local food sales in Norway have increased from 11,2 billion NOK in 2021 to 11,5 billion NOK in 2022 (Government, 2022b), showing an increased interest in locally produced food, and according to a report from Norwegian Food Authority (2021), the large retailers have seemingly also increased their interest for locally produced food. In the Norwegian market, the governmental food policies are said to cover the entire supply chain (SC), where their main objective is to safeguard the SC in to be most possibly safe, sufficient, and with reasonable prices with high quality food (Government, 2022a). Yet, the retailers who sell the finished food products to the end consumers are the once that often get away with the highest profits. Norway stands out from the other countries in Europe by the high concentration of power in the grocery industry, and in the latest years the retailers have increased the vertical integration in the sector, by ‘forcing’ cooperation in the wholesaler sector (Norwegian farmer organization, 2022).

The global food systems (GFS) have over the last decades been seen as unsustainable due to the responsibility for food waste, environmental damages through overuse and increased waste, in addition to a skewed and unfair allocation of received value among the different actors through the supply chain(s) (Mancini et al., 2019). This is supported by Todorovic et al. (2018) who pointed out that traditional food supply chains (TFSC) are a part of increased and extensive food waste, environmental problems, and damages, and has therefore also contributed to an increase of interest for the quality of food and food production, shifting towards more focus on local production of food.

Throughout the latest decades the different SC’s related to food and it’s belonging industry has been both globally industrialised, and reshaped when it comes to production strategies, the access for the food products, and how it is being consumed (Aggestam et al., 2017). Further, Aggestam et al. (2017) found that the focus area has been upon the economic efficiency. As such the food producers have continuously been struggling to operate despite the lowering in financial returns. However, at the same time keeping a pressure on the ecosystems to be able to meet societies demands for lower prices on the food.

Throughout the literature, there have been several studies about the local food supply chain (LFSC) under different names, but often in the perspective of short food supply chains (SFSC) (See e.g., Abate-Kassa & Peterson, 2011; Campos et al., 2021; Doernberg et al., 2022; Mancini et al., 2019). SFSC focuses among others on a reduction of economic operators in the total SC, of local food (Malak-Rawlikowska et al., 2019), which in turn through studies, has been found to improve the economic sustainability for local food producers (Renkema & Hilletoft, 2022).

Moreover, recent events such as the Covid-19 pandemic and war, has increased the discussions and realizations about the importance of local food production (Alsetoohy et al., 2021; Ben Hassen & El Bilali, 2022; Hobbs, 2020; Jones et al., 2022). Despite this, there is little research on how factors such as: SFSC, imbalance of power and internal and external barriers, together impact the local food producer's economic sustainability. This paper aims to provide knowledge to this field by investigating the following three research questions:

**RQ1:** Does an imbalance of power impact producers' economic sustainability?

**RQ2:** What is the impact of producer's external barriers on their economic sustainability?

**RQ3:** What is the impact of producer's waste on their economic sustainability?

To answer these research questions, this study used a mixed method. First, a questionnaire answered by 57 respondents, and second interviews with four interview objects. The questionnaire was analysed using Partial least squares structural equations modeling (PLS-SEM), and the interviews were analysed using a thematical analysis. The hypotheses for PLS-SEM are based on previous research literature.

## **1.1 The structure of the thesis**

This thesis consists of two parts: first an introduction part and second; a research paper. Part one of the thesis comprises a more complete literature screening, with one introductory section for Supply Chain Management (SCM), value chain (VC) and Food Supply Chain Management (FSCM). Before the literature connected to the hypotheses, as well as prevalent methodology, conclusion, and research summary. The second part of the

thesis consists of the specific research article. Containing the additional hypothesis testing, results and findings, and discussion. Figure 1-1 illustrates the structure of this thesis.

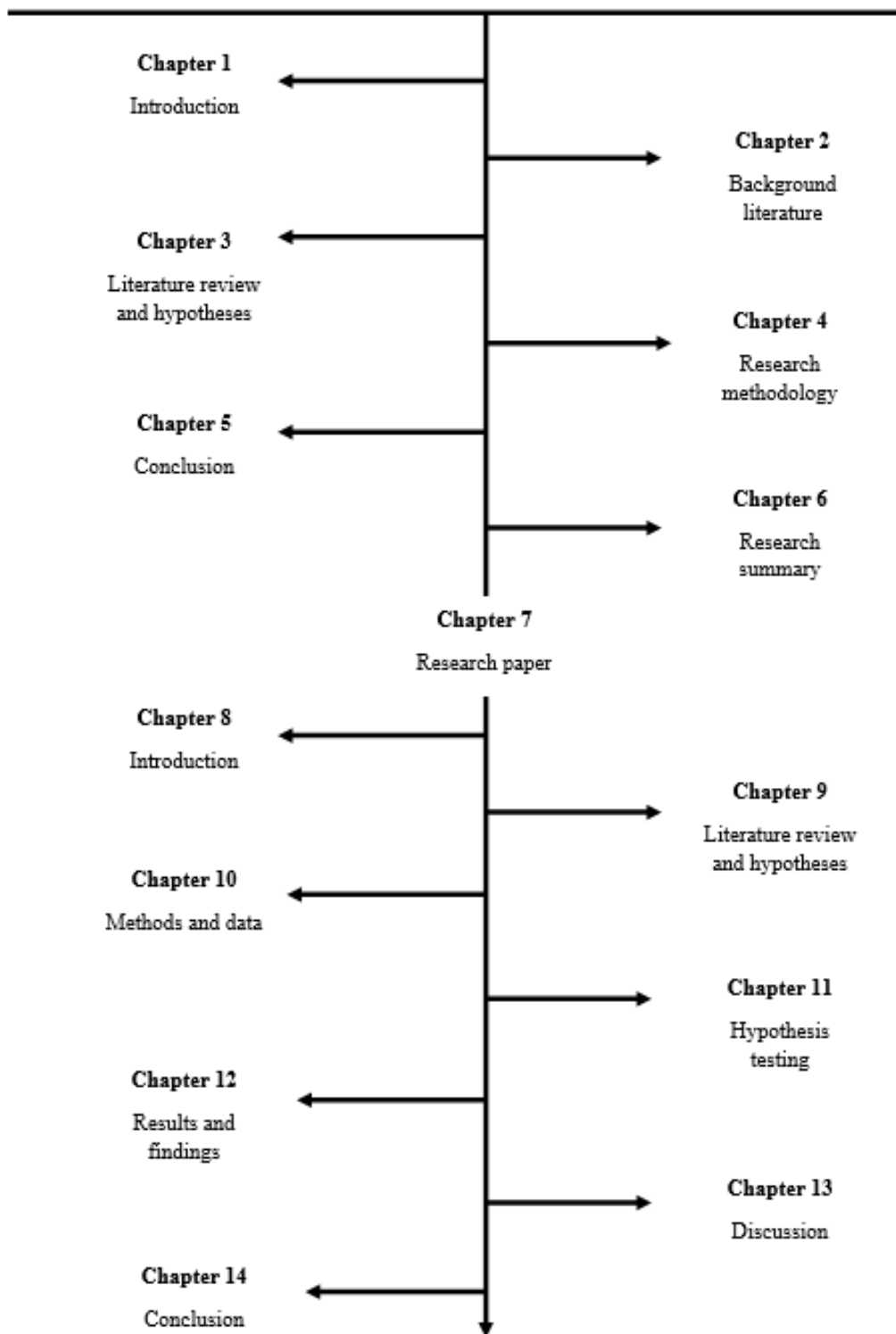


Figure 1-1 Structure of the thesis.

## **2.0 Background literature**

This chapter comprises the background literature included, such as supply chain management, value chain, and food supply chain management. In addition to how the term “local” is defined in the context of local food.

### **2.1 Supply Chain and Supply Chain Management**

The term Supply Chain Management (SCM) was started in early 1980’s, and Already in 1997, the SCM term was increasingly used (Lambert & Cooper, 2000; Mentzer et al., 2001). Today, 26 years later it is still becoming more prominent throughout the literature. Only using Google Scholar with the search term “Supply Chain Management” gives a result of 4.160.000 articles in about 0,16 seconds, showing the amount of research in the field.

One can find several different definitions of both Supply Chain (SC) and Supply Chain Management (SCM), all depending on both context and the author(s). However, Mentzer et al. (2001) found definitions for the term “supply chain” to be more common compared with definitions of the term “Supply Chain Management”. As such Mentzer et al. (2001, p. 3) explained that a Supply Chain consists of a network of different organizations, involved by both upstream (i.e., supply) and downstream (i.e., distribution) linkages, through several different activities and processes, in order to produce value from products and services delivered to the end-consumer. Further, since there are several other definitions of the term SCM, three of the definitions have been included in table 2-1. SCM lays the fundament of this thesis and helps with understanding the basic principles of the SC for local food from production and to the consumers.

Table 2-1 Definitions of Supply Chain Management (SCM).

<b>Author(s)</b>	<b>Definition</b>
Croxton et al. (2001, p. 13); Lambert and Cooper (2000, p. 66)	<i>“Supply Chain Management is the integration of key business processes from end user through original suppliers that provides products, services and information that add value for customers and other stakeholders”.</i>
Harrison et al. (2019, pp. 8-9)	<i>“Supply Chain Management encompasses the planning and controlling of all processes involved in procurement, conversion, transportation, and distribution across a supply chain. (..) In essence, SCM integrates supply and demand management within and between companies to serve the need of the end-customer”</i>
Stock and Boyer (2009, p. 706)	<i>“The management of a network of relationships within a firm and between interdependent organizations and business units consisting of material suppliers, purchasing, production facilities, logistics, marketing, and related systems that facilitate the forward and reverse flow of materials, services, finances and information from the original producer to final customer with the benefits of adding value, maximizing profitability through efficiencies, and achieving customer satisfaction”.</i>

## 2.2 Value Chain

In 1985, Michal Porter who at the time was a Harward business School professor, came up with a description of the value chain (VC), and it will be used as a reference for this section. A VC is consistent of different activities and/or sources to value, and a margin that is achieved by these activities. Michael Porter (1985) used the term ‘value chain’ in order to explain series of a company’s value added activities and he differentiated between Primary – and support activities (Christopher, 2012; Fearne et al., 2012).

Before explaining the two latter activities, the basic background motive of the VC should be explained. Christopher (2012, p. 5) used the statement of Porter (1985) where he among others said that *“competitive advantage cannot be understood by looking at a firm as a whole. It stems from many discrete activities a firm performs in designing, producing, marketing, delivering, and supporting its product. Each of these activities can contribute to a firm’s relative cost position and create a basis for differentiation. (..) A firm gains competitive advantage by performing these strategically important activities more cheaply or better than its competitors”*. The basic of the original paper by Porter (1985) implied that companies should look at each activity involved in their VC, and judge if each specific

activity contributes to a real competitive advantage. If not – outsourcing these activities could be beneficial (Christopher, 2012).

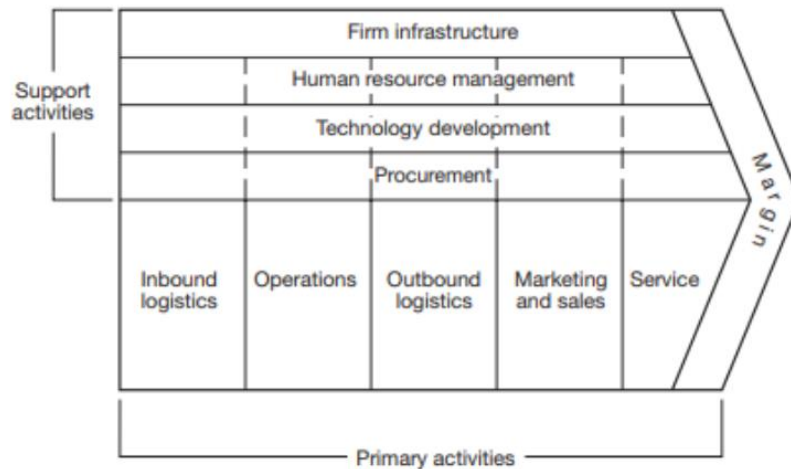


Figure 2-1 Primary and support activities illustrated (Porter, 1985).

The primary activities are those activities that are essential for providing the company’s value to the customer (Van Weele, 2018). For this Porter (1985) differentiated between five general categories: Inbound logistics, operations, outbound logistics, marketing and sales, and lastly services. On the other hand, the support activities are split into four categories including: Procurement, technology development, human resource management, and firm infrastructure (Van Weele, 2018). The primary and support activities are illustrated in figure 2-1.

The value chain is important to give a deep understanding of a firm’s competitive advantages and how the different activities are connected. Further, it is also an important contribution in SCM. For this thesis, it increases the understanding of what the different primary and support activities are for the local food producers.

### 2.3 Food Supply Chain Management

The topic of food supply chain management (FSCM) is of importance to increase understanding for the SC of more local produced food. The food industry is made up of a huge amount of different businesses, that manufacture/produce and process, and transform both raw materials and semi-finished food products, that stem from primary activities and processes such as farming/agriculture, zootechnics, fishing and fisheries, forestry, and more (Manzini & Accorsi, 2013). Contemporary supply chains for food both collect and transport and deliver the products all over the world. This connects both



manufactures/producers and consumers, that are initially separated by thousands of kilometres (Li et al., 2014). Food products produced and processed in a specific region are bought and sent all over the world. Food goods, regardless of their origin, travel all over the world, encountering various climates, weather conditions, and handling activities (Li et al., 2014)

The food supply chain, just as the traditional supply chain for all other goods and products, includes the activities and/or operations concerning the production, distribution, and consumption of the products. In addition to keeping both the quality and the safety of the food products in effective modes (Zhong et al., 2017). However, what differs the ‘normal’ supply chain, from the food supply chain is among others the food safety, quality, and the limited time of food freshness. As a result, the food supply chain is often times harder to manage (Zhong et al., 2017). Knowledge about FSCM is of importance for this study for the same reasons as the importance of SCM, and so that the reader can understand the underlying principles of how food is processed from the producers and to the consumers.

## **2.4 Defining the term “local”**

Often times the term ‘local’ is understood as the direct opposite of ‘global’ (Kneafsey et al., 2013, p. 27). Yet, there is still no one definition that is legally agreed upon of ‘local’ as a term, as this is often something that is subjective, and both experienced and understood in relation to the specific geographical area(s). In addition, there are factors such as population density and urban characters that play a vital role in the definition (Kneafsey et al., 2013). This is supported by Enthoven and Van den Broeck (2021, p. 2) where they found that “(...)different interpretations of the ‘local’ scale exists”, specifically in the context of food production. Further, they found that in the United States of America, local is described as something that is under 644 km from where the products origin and/or state of production (Enthoven & Van den Broeck, 2021), while in Canada local is if it is produced either in the same province of the sale or across different provincial borders, but not further than 50 km away from the products place of origin (Enthoven & Van den Broeck, 2021). On the other hand, for Europe the scale varies a lot depending on the country. Still, Enthoven and Van den Broeck (2021, p. 2) found one collective definition saying that local can be determined by a specific geographical area, between a 20-100 km radius.

From another perspective Trivette (2015) found that there are mainly two ways that people in general formulate what counts as local; either by proximity or by relationship. Within local by proximity, it was found that this could be divided by either distance, ranging from 80 km to 644 km, or by the use of geographical and/or political boundaries, i.e., by countries, region of states, and more (Trivette, 2015). However, both alternatives of proximity also influence each other. Additionally, it was found that proximity also is related to access to the market from a producer's point of view, and as a source for the retailers and consumers, and that local proximity is dependent on such as access to population dense areas. One example used to explain this is the density of the US East coast, which could imply that local food may be limited within about 160 km away from a larger city in the same region, yet in e.g., in Utah in the US local food could span several hundred km because of the distance to larger cities (Trivette, 2015). Taking Norway into account, it is well known that it is a large country with greater distances between counties and municipalities. When merging this with the previous definitions of local, it is not implausible to assume that local food may travel hundreds kilometres to reach larger cities in Norway. The other perspective that was found is "by relationship" (Trivette, 2015). Dunne et al. (2011) and Tovey (2009) found that several consumers see local food as having a personal connection directly with the producers, and that it is not unnormal to include both distance and a relational component when defining local food.

Furthermore, Trivette (2015) also found that different scope of local is a necessity for the different types of sales channels as well. An example was made that a grocery store would need a larger range of different types of food in order to meet the demand of all the different consumers they have as customers. While a restaurant would need less variety of different food products because of a smaller menu, but in a higher volume of the products they buy.

In this thesis I will be using the term "local" from the different regions in Norway. Where each region has its own local food supply chain. Meaning that in sum, the different regions across Norway, work as the place of origin for the local food products, and thus producers in this study.

### **3.0 Literature review and Hypotheses**

This chapter comprises the specific literature review, which is connected to the hypotheses for this study.

#### **3.1 Supply chain for locally produced food.**

The forerunner of the term Short food supply chain (SFSC) were the traditional food deliveries, that were based on the direct sales in farmers markets (Malak-Rawlikowska et al., 2019). Previously, around the 18<sup>th</sup> century, markets were more “strategic outlets” connecting the cities with the country sides. Over the years this was developed to more long logistical mass distribution in the food supply. While today, the food market connect somewhat traditional and direct food delivery with more innovative distribution that connects the producers and consumers (Malak-Rawlikowska et al., 2019).

Through both literature and the public, one can find several different names such as “alternative food networks”, “sustainable supply chain”, “green supply chain”, “Conventional network”, “more conventional industrial modes” , “Local food systems” and “Short Food Supply Chains” (Malak-Rawlikowska et al., 2019; Thomé et al., 2021; Visser et al., 2013). This means that there are several different definitions, and that they are called differently depending on the perspective of the research. However, a closer look at the definitions revealed that they essentially are used to express the same thing. They can therefore be viewed as synonyms for the same expression.

This is supported by Thomé et al. (2021) and also Vittersø et al. (2022), where last named found that the term of SFSC is often used as an umbrella term in order to capture a large range of different initiatives and schemes, despite the diverse practices and history of the schemes and initiatives, where they all share both governance approaches. In addition to organizational structures, that could be used as alternatives for more traditional food supply chains and distribution. As a result they concluded that there is not just one way of developing and seeing the SFSC, since the experiences vary across Europe, depending on both country and regions (Vittersø et al., 2022).

One explanation of local food systems (LFS) is a system where the food is produced, processed, and retailed within a determined geographical area (Kneafsey et al., 2013, p.

23). Additionally, the LFS is also intended to work as a network of several producers within a specific context (Visser et al., 2013). Another way of explaining the SFSCs is through the definition by Mancini et al. (2019, p. 1) “(...) *involving a limited number of economic operators, committed to co-operation, local economic development, and close geographical and social relations between producers, processors and consumers*”.

Additionally, one of the main characteristics for SFSC is the involvement of producers that have a limited capacity when it comes to both production and the logistics in general (Bayir et al., 2022). Also Balcom et al. (2023) agreed that although there is a range of different ways of defining SFSC, a general description is by the distance of where the food is either grown or produced and to the consumer.

Even though the terms SFSC and LFS are frequently used interchangeably, some researchers may disagree. Among others, Stein and Santini (2022) argued that there are in fact differences in the two terms, specifically by the parts of ‘local’ in LFS and ‘short’ in SFSC. Among the discussion upon the differences, they pointed out that the ‘short’ part of SFSC often times are not linked directly to the distance, e.g., geographical distance between producer(s) and consumer(s), but rather linked to the number of economic operators in (actors) in the SC. LFS on the other hand are more directly focused on the ‘local’ definition, in the sense that “*the local is always experienced and understood in relation to larger geographical scales, such as regional, national or global*” (Stein & Santini, 2022, p. 78). Meaning, that the products are both retailed and produced and processed to the consumers within a specific area. However, this is where the term could be further discussed as the term ‘local’ when removed from LFS, is subjective and will always be context related (Stein & Santini, 2022).

As one can see from the several different names evolving SFSC, this concepts have been widely studied throughout the literature, and through the study by Renkema and Hilletoft (2022), there was found to be a definitive increase in studies of SFSC from 2014 to 2022. Although there are disagreements found on the nature of both LFS and SFSC, the LFS are mainly researched through SFSCs as frameworks, meaning that the term, in general, is used to describe the SC of local food products (Abate-Kassa & Peterson, 2011). As such this thesis will use the term SFSC as the term to describe local food producers supply chain, and the following sub-section goes further into the SFSC literature.

### **3.1.1 Short Food Supply Chain**

The origin of SFSC's began with the study by Marsden et al. (2000) who used the term "SFSC" as an umbrella term, when identifying three different types: Face-to-face, Spatial proximity, and Spatially extended. In all three of the groups, Ilbery and Maye (2005) found that the key characteristics are that all food products reach the end-consumer after being sent through a SC, containing valuable information about the mode of among others production, origin of the product, and peculiar quality assets of the food product.

For the face-to-face type of SFSC personal interaction facilitates both authenticity and trust. Meaning that a consumer buys a product in person directly from the producer/processor. This could also be done through online trading and web pages (Marsden et al., 2000). This is supported by Kneafsey et al. (2013) who found internet trading to be either a replacement or an extra alternative to buying directly from the producers.

Second, 'Spatial proximity' means that products are produced and retailed in the place of origin, and the end-customers are kept informed of the locality of the product at the time of sale (Marsden et al., 2000). This type of SFSC overlaps the 'face-to-face' SFSC in some ways. Yet, this type also includes among others specialist retailers, hospitality industry, the public sector, and supermarkets (Kneafsey et al., 2013). Further, also here included the food boxes, similar to with face-to-face. In addition, they included sales directly to the retailers and/or supermarkets/hypermarkets.

The third type 'Spatially extended', is when consumers who live outside of the region of production and may have no first-hand familiarity with that region, are given information about the location and procedures of production (Kneafsey et al., 2013). In this type, the information about the product is communicated through among others branding, promotion, and product packaging. In addition to the use of certification and regulation to safeguard products and product names with various geographic roots (Kneafsey et al., 2013). This form of SFSC's is therefor used as a so called 'side-step' for defining 'local', which, as mentioned above, could be challenging. Instead, the focus is shifted towards whether the product characteristics could be attributed to small/specific geographical areas.

For instance geographical areas defined by specific climate, local skills and/or knowledge, soils, and more (Kneafsey et al., 2013).

*Further developments of SFSC's.*

As a result of the increased importance today when it comes to 'spatially extended', it encompasses the situations where a product is being delivered to the consumers, through the use of labels and more, in addition to the variety of interpretations of SFSC. Moreover, Malak-Rawlikowska et al. (2019) found three different proximities defining the SFSC: Social proximity, organizational proximity, and physical proximity.

For the so called 'social proximity', the relation and/or relationship between the producers and consumers is emphasised for a two-way trust, and the length (i.e., closeness) of the information transferred from producer to consumer (Malak-Rawlikowska et al., 2019). The second: 'organizational proximity', is about the number of actors in the total supply chain to the consumers (i.e., end-costumers), where the optimal for being able to call the producer/farmer to be a part of an SFSC should be between zero and one (Malak-Rawlikowska et al., 2019). Third, which is the physical proximity, is about the transportation distance between the producer's location and to the end-consumer (measured in Food Miles) (Malak-Rawlikowska et al., 2019).

Another extension to the SFSC's was made by Renting et al. (2003). They extended the term by adding that, not only are the SFSC composed through few steps in the local area or region, but also that the chains could constitute the international networks spread across country boarders (producers and consumers) (Thomé et al., 2021). Meaning the inclusion of fair trade labels, certificates showing origin of product, and the designations of origin labels (Thomé et al., 2021). This could also be seen as a point for discussion when looking back at the sub-section of defining local.

According to Lamine (2015), SFSC's often times fail to acknowledge the interdependencies in e.g., agri-food, where the products mostly are processed and distributed by the use of intermediaries. Where intermediaries is when producers make use of for instance other organizations in the supply of their products (Renkema & Hilletoft, 2022). Further they referred to Christensen et al. (2019), where it was found that in cases

where there are differences in size and/or numbers of producers, processors and retailers, the local food producers often times need to use cooperatives and/or wholesalers. This is to help the producers with among others; keeping products supply available, communication between members of the supply chain, assurance of food safety and quality control. As a result this has been referred to as intermediate SFSC's (Renkema & Hilletofth, 2022).

*Different sales channels and the Norwegian perspective.*

In a study by Milford et al. (2021) they differentiated between local and mainstream marketing. Where they described the mainstream marketing to be through the large producer organisations and main wholesalers in Norway. Which throughout this thesis is referred to as umbrella chains. On the other hand, local marketing was used to describe sales channels such as Farmers markets, farm shops, different types of stands, producers' direct delivery to consumers and more (Milford et al., 2021). Further, they found that the choice of which sales channels to use, was based upon both personal characteristics and preferences by the producers, in addition to characteristics of the production facility. In total they divided the types of sales channels into 12 main categories: (1) direct to consumer (e.g., farm shop), (2) direct to speciality store, (3) mainstream supermarket, (4) direct to restaurant, (5) other markets (e.g., stand at festival), (6) own delivery to consumer, (7) other wholesalers, (8) other, (9) delivery to food box scheme or consumer cooperative, (10) community supported agriculture, (11) Direct to industry, (12) farmers market (Milford et al., 2021, p. 283). However, the study was concentrated too organic fruits and vegetables in Norway: Which means that for this specific thesis, where the focus is on all types of local food in Norway, there might be a slight, although not significant, difference in the sales channels compared with the 12 mentioned above.

There are several previous studies that have found both drawback and advantages for local food producers when it comes to the choice of sales channels/marketing channels (Milford et al., 2021). Among others Kim et al. (2014) compared the risk and return factors of selling through farmers markets versus selling through what the referred to as wholesale market channels in the US, i.e., what Milford et al. (2021) refers to as mainstream wholesalers. In the study, they found that reasons for selling through a mainstream wholesaler are among others transparent pricing, lower marketing costs and overall lower risks (Milford et al., 2021). Further LeRoux et al. (2010) found through their study about

investigating the relative benefits, and costs of sales channels for small scale vegetables crop producers, that producers selling through farmers markets had the possibility for gaining a higher net sales income than selling through wholesalers. While on the other hand, a study by Hardesty and Leff (2010), where they investigated the marketing costs versus returns in marketing channels, found that there were lower marketing costs for the producers by selling through wholesalers (Milford et al., 2021, p. 281).

As for several other countries, the Norwegian retail market is known to be concentrated around a few retail/grocery store chains. However, in Norway, the wholesale market for these sectors is also being classified as oligopolies or duopolies. This is a result of that these so-called umbrella chains often cooperate as both wholesalers and processors (Milford et al., 2021). Between 1980's and 1990's there was a large restructuring of the retail sector in Norway. At that time there were four major Retail chains in Norway: ICA Norge, Coop Norge, Norges Gruppen and Rema1000 (Richards et al., 2013). However, today there are only three major retail chains since Ica Norge today is a subsidiary company under coop Norge. According to Kjuus (2010) the restructuring among others contributed to establishing more differentiated store categories, boosted efficiency and enhanced a larger variety and availability of food to the consumers.

Furthermore, Kjuus (2010) also included that the umbrella retailers , contribute to the making of a larger concentration of power in the food chain, which in turn makes it difficult for producers to get access the retailers store shelves (Kjuus, 2010; Richards et al., 2013). In addition, it is known that there is a limited number of distribution channels that the producers have the possibility to choose from (Amilien, 2011). This means that although there are many different transportation companies, one could say that there are mainly three options: distribution through wholesalers owned by the umbrella chains, producers arranging their own distribution, or the use of some smaller distributors. In addition, one could also say that the more distribution channels producers could choose between, the more options there are for SFSC. It could be that some of the channels have more convenient pick-up services, or they are less expensive. Further, the composition of the distribution providers used by producers, may also have a positive impact on pricing.



Yet, despite the high concentration of power favouring the retail chains, they still have not reached into the structural authorities when it comes to managing the food market outside of their own boundaries, and that their power upstream in the supply chain is limited because of a stronger cooperative position in the producer's section (Kjuus, 2010). Still, in the literature it has been argued that the increased imbalance of power has led local food producers in to an "arm-lock", where producers are potentially forced out from key sales channels (e.g., larger retailers). In turn, this could be a result of the governing of the large chains by keeping high private standards (e.g., private standards for distribution, packaging and more), in addition to a rationalisation of the biases in the industry (Amilien, 2011; Richards et al., 2013).

Based on the above backdrop, I argue that the number of economic operators used in the SC (from SFSC), is related to the imbalance of power found to be in the sales channels, and that the imbalance of power has a negative effect on producers' economic sustainability. Where the latter also is affected by the number of distribution options used by the producers. As such, I propose the following three hypotheses:

**H1:** The number of economic operators in the supply chain, is associated with the producers' imbalance of power in the sales channels.

**H2:** The imbalance of power has a negative effect on producers' economic sustainability.

**H3:** The number of distribution options strengthens the effect of imbalance of power to producers' economic sustainability.

## **3.2 Sustainability**

Sustainability is a broadly used term in the literature across almost all subject areas. According to Jarzębowski et al. (2020), sustainability is widely used within the context of SCM, including for the research within SFSCs. In this context they found different sustainability aspects to play a vital role in the connection with the consumers demands for among others food traceability, food quality, increased margin distribution and local development from an economic perspective. Sustainability is according to Nave and Do Paço (2021) a concept that sees the agenda of organizations, companies and public

institutions, and is a challenging concept for all the sectors in today's society. As a result, sustainability is of steadily increasing importance for companies.

In a research done by Pater and Cristea (2016), they found several critical conclusions towards the term sustainability in literature. Among others, they found the term 'sustainability' to be somewhat vague formulated and connected to sustainable development, and hence also the term to have been overused. Further, they found the term to be poorly differentiated from concepts such as resilience and durability (Pater & Cristea, 2016). As a result, they used the definition of Hodge (1997, p. 9): "*(..) the persistence over an apparently indefinite future of certain necessary and desired characteristics of both the ecosystem and the human subsystem within*". Still, for this thesis, the definition is somewhat broad. As such, within the context of food supply chains, Vittersø et al. (2022, p. 7) defined sustainability as "*(..) one that strives for managing economic, social and environmental impacts for the delivery of products and services, securing long-term value for all involved stakeholders*".

When searching for sustainability in the literature, the most common mix to find is the triangulation of social, environmental and economic sustainability, also known as the three pillars/dimensions of sustainability, see for instance Purvis et al. (2018). However, this study has focused on the economic dimension which can be seen in the next sub-section. As such the two remaining (i.e., social, and environmental), will not be the focus area of this thesis.

### **3.2.1 Economic sustainability**

Economic sustainability and its dimension can be defined as "*(..)addressing organizations impact on local, national and global economic systems*"(Muhammad Kaleem et al., 2022, p. 3). Implying a focus on maximizing existing resources within a business entity in a way where organizations could keep functioning at a predetermined activity level both today and in the future (Muhammad Kaleem et al., 2022). Further, Muhammad Kaleem et al. (2022) continues describing economic sustainability by including that, the goal should be to encourage the use of these resources within a long-term perspective. Since the economic sustainability also both includes and involves viability of the business and organization for a long-term, in addition to long-term stability of the businesses economic system.

This perspective of economic sustainability is supported by Vittersø et al. (2022), where they mentioned that economic sustainability in context of the food supply chain, concerns the viability and the competitiveness of the actors in the supply chain(s). Economic sustainability relates to increased opportunities for improved income for all actors involved, in addition to job creations, which is related to long-term increased value creation (Vittersø et al., 2022). However, in order to create economic sustainability in the local food industry, the food and its quality also need to be affordable and accessible for the consumer, meaning that if the food products are e.g., overpriced or not found, there is no economic sustainability (Vittersø et al., 2022).

According to Closs et al. (2011) economic sustainability considers the companies effort to increase their total value, while at the same time also lowering their cost associated to how the company conducts its business throughout the SC. In addition to other strategies surrounding the business such as marketing and financial strategies (Closs et al., 2011). Further, they divided economic sustainability in two main categories related to management: internal management and external management. The internal management of the economic sustainability dimension focuses on among others continuous improvement of the company, constantly narrowing the focus towards the trade-offs that a company must consider. The second category is the external management, this category expands the internal management category through including among others the consideration for outsourcing activities within the company, which in turn possibly could lead to a reduction of the company's overall costs. As an example, a company producing local food may benefit from the economy of scale that could be a result from outsourcing its transportation to another company, instead of handling the transportation 'in-house'. In addition, this category includes among other suppliers management and marketing/growth in a specific market (Closs et al., 2011)

Economic sustainability and SFSC should in theory go along with a number of different factors combined, in order to guarantee a producer increased income both direct and indirect (Enjolras & Aubert, 2018). If so, direct is a result of that SFSC in several cases could enlarge the value of the product, and since there is a limited number of economic operators in a SFSC, it could also allow the producer(s) to obtain a larger share of the added value (Enjolras & Aubert, 2018; Mancini et al., 2019). An indirect effect can be

connected to the direct effects, where the operating costs for such as e.g., transportation could be decreased, over time resulting to an increase of operating income and margin (Enjolras & Aubert, 2018).

The economic aspect of SFSC can according to Jarzębowski et al. (2020) be connected to three main points; firstly, it could be beneficial for reducing information asymmetry both in context of the products but also for the process from production to end-consumer. This can lead to improved economic sustainability, because of improved transparency between actors (often due to fewer actors involved), and fair contracts. Second, it could lead to the reduction of transaction costs between the different actors in the SC, which is a result of fewer parties involved in the SC. And lastly, they found it to be able to lessen the opportunism and uncertainty in the SC, also as a result of a shortening of the actors involved (Jarzębowski et al., 2020). Furthermore, They found the SFSC to have a positive impact on economic sustainability, through amongst others; generating employment in local areas (new jobs), the economic uncertainty faced by several farmers could be reduced, re-circulation of community income increases, in addition to increased support when it comes to small to mid-sized farmers (Jarzębowski et al., 2020).

### **3.3 Barriers**

According to Laurett and do Paço (2018) barriers can be seen as problems and/or situations that prevent an activity or action from being carried out. Meaning that a barrier can be either a situation or a problem that makes a specific something more challenging. In the case of this study, the barriers are related to local food producers' economic sustainability. In a study by Laurett and do Paço (2018) they listed several different barriers that they found throughout the literature, and divided them into 15 categories.

Further, Nave and Do Paço (2021) categorized some of these barriers, into both external (extrinsic) and internal (intrinsic) barriers. The external barriers found where among others; too little knowledge about technology (in addition to difficulties with infrastructure), legislative barriers (such as poorly or too little knowledge about legislation), and governmental (referring to among others a lack of support policies) (Nave & Do Paço, 2021). The internal barriers that they found where among others: lack of both material and human resources, too little knowledge and information, financial constraints, and difficulties for company change (Nave & Do Paço, 2021).

Moreover, Balcom et al. (2023) found market access for local food producers to be difficult to achieve. Among others this was argued to be because of two scenarios; either difficulty with the producers selling products them self, because of the initial costs of set up, storage suitable for the food products, and location. Or, because of the difficulties with selling products to grocers that could offer lower prices according to smaller businesses, and if not, they would face loss of revenue in the long term. Additionally, in the study by Milford et al. (2021) it was found that in the case of organic food and vegetables, the supermarkets or lager grocery stores often times require the producers to provide rather large quantities of the uniform products, which could be difficult for smaller food producers to match.

From the above-mentioned external barriers, I argue that they can be seen in relation to the imbalance of power in the sales channels. Further, I argue that these external barriers also could challenge local food producers' to be economic sustainable. As such, I propose the following two hypotheses:

**H4:** Producers external barriers is associated with the imbalance of power in the sales channels.

**H5:** Producers external barriers is negatively associated with producers' economic sustainability.

From the above-mentioned internal barriers, it is not unreasonable to argue if the internal barriers for a local food producer increase (i.e., several internal barriers), the stronger is the producer's position towards the imbalance in the sales channels. As such, I propose the following hypothesis:

**H6:** Internal barriers of local food producers' have a positive effect on the imbalance of power in the sales channels.

Further, connected to the internal barriers for economic sustainability, one aspect could be the waste in production (i.e., raw materials and finished products). In a study by Bayir et al. (2022) food waste was considered as among others an economic sustainability challenge for local food producers. Which is not surprising since food products that are

either thrown away because of either expiration dates, quality or similar, or remains of ingredients that are not used further in the production, is potential loss of revenue for the company.

Based upon the section above, I argue that the more waste from both raw materials and finished products, the lower the economic sustainability is for the producers. Moreover, including the internal barriers, I argue that since internal barriers could prevent producers from growing and/or limit the amount of product they sell, there would naturally also be less waste. As such, I propose the following two hypotheses:

**H7:** Producers waste in production has a negative effect on producers' economic sustainability.

**H8:** Internal barriers effect the waste in production.

### 3.4 Hypothesis and conceptual model

Based on the literature review, there has been identified seven variables which may have an impact on the local food producers. The variables are listed in table 3-1, as well as the description used in this study for each variable.

*Table 3-1 Description of variables used in the study.*

<b>Variable</b>	<b>Description</b>
External barriers	Barriers outside the company that has the potential to hinder local food producers to be economic sustainable in the long run,
Internal barriers	Barriers that could occur inside the producers' company, and potentially be a hinder for either growth or economic sustainability in the long run.
Number of economic operators	The number of economic operators used in the SC, from producers to consumers.
Imbalance of power	Local food producers' position to the imbalance of power in the sales channels.
Economic sustainability	The economic sustainability of local food producers (in this study producers' profitability has been used).
Number of distribution options	The number of different distribution options used by each production company. There are three options in this study: using large wholesalers, using smaller wholesale companies, or managing own distribution in-house.
Waste	Waste from raw materials and/or finished products for the local food producers.

Based upon the literature in the previous subsections, and the identified variables, eight hypotheses were derived. Table 3-2 shows the summary of these hypotheses.

Table 3-2 Summary of the eight hypotheses used in this study.

Hypotheses	
H1	The number of economic operators in the supply chain, is associated with the producers' imbalance of power in the sales channels.
H2	The imbalance of power has a negative effect on producers' economic sustainability.
H3	The Number of distribution options strengthens the effect of imbalance of power to producers' economic sustainability.
H4	Producers' external barriers is associated with the imbalance of power in the sales channels.
H5	Producers' external barriers is negatively associated with producers' economic sustainability.
H6	Internal barriers of local food producers have a positive effect on the imbalance of power in the sales channels.
H7	Producers waste in production has a negative effect on producers' economic sustainability.
H8	Internal barriers effect the waste in production.

The conceptual research model (figure 3-1) is developed based upon these eight hypotheses, and the relationship between them. In the model “producers’ economic sustainability” is the dependent variable.

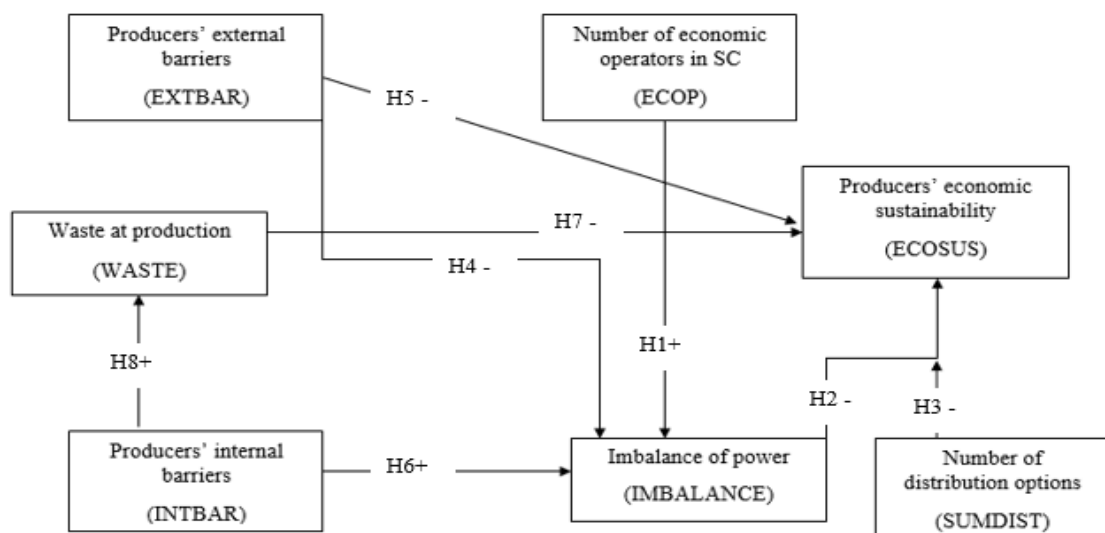


Figure 3-1 Conceptual model.

## **4.0 Methodology**

This chapter includes the methodology choices made for this thesis, and includes the following: research approach, research design, level of analysis, research setting, and data collection for both qualitative and quantitative data. Further, this chapter also includes explanation of the analytical approach for both qualitative and quantitative data, followed by validity and reliability of the study.

### **4.1 Research approach**

According to Saunders et al. (2012) there are three different types of research approaches; deduction, induction or abduction. A deductive research approach is characterized by starting with theory, and then conducting a study with the goal to test the specific theory. An inductive approach is characterized by collecting data with the goal to explore a specific phenomenon, and then using this data to either build, or generate theory. Lastly, an abductive approach is when the collected data is used to explore a phenomenon, explaining patterns, and identifying themes in order to create either a new or to modify existing theory (Saunders et al., 2012). In this study the theory was gathered in the beginning, where the goal is to test the hypotheses that has been derived from the found theory. As such, this study holds a deductive research approach.

### **4.2 Research design**

Research design(s) are different forms of inquiry within either quantitative, qualitative, or mixed method approaches that give a specific guide for the procedures in research. This term has also been named strategies of inquiry by other researchers. Quantitative research design can often be seen as one that uses data collection techniques that either uses or generates numerical data. Qualitative research design is often used for data collection techniques that either uses or generates non-numerical data (Saunders et al., 2012). On the other hand, a mixed method approach has the core assumption that the integration of the two types of data, provides additional insight combined, beyond the scope of each data alone (Creswell & Creswell, 2018). Furthermore, mixed method goes by different terminologies such as among others multimethod, integrating method and mixed research (Creswell & Creswell, 2018). This study holds a mixed method approach, including both quantitative data and qualitative data.



Mixed method designs has its origin from 1959, where Campbell and Fisk used several methods in their study of psychological traits, and the field of mixed method research which we see today began in around the middle of the 1980's (Creswell & Creswell, 2018). The early thoughts about the mixed method approach was that each method type has both weaknesses and biases, and through collecting both qualitative and quantitative data, the weaknesses in each form is neutralized (Creswell & Creswell, 2018; Ghauri et al., 2020). In turn this led to the triangulation of data sources, i.e., method triangulation. Where triangulation also refers to combining different methodologies when studying the same phenomenon. When using triangulation, the discussion of validity is highly relevant. This is because, in order to enhance the validity of a study, sometimes it is necessary to collect and/or analyse the data through triangulation (Ghauri et al., 2020).

This thesis is based upon a convergent mixed method. Which is a form where the researcher either merges or converges, qualitative and quantitative data to give an extensive analysis of the research problem. Using this design, one has typically collected both the quantitative and the qualitative data around the same time, and from then integrated the data in the discussion of the results (Creswell & Creswell, 2018). The quantitative part of this study is based upon survey research (i.e., questionnaire), while the qualitative part is based upon interviews.

### **4.3 Research setting**

Across Norway there are about 516 local food producers that are registered with a valid self-audit and have through that confirmed that the production is according to Norwegian regulations for safe food (Norwegian food foundation, 2023). The level of analysis in this study has been Norwegian local food producers.

The setting of this study is Norway. The latest years local food producers in Norway have had major challenges associated with the price increases, increasing cross-border trade and the closure of society, but despite this the sales of locally produced products has increased from 11.2 billion in 2021 to 11.5 billion in 2022 (Government, 2022b). This study's targeted respondents are local food producers in Norway. Additionally, I have included four respondents that are well familiar with the local food industry from four different

point of views, with the primary focus on the producers and the focus industry of this study.

#### **4.4 Data collection**

Whitin research there are two main types of data: Primary and secondary data.

In this thesis both primary data and secondary data has been used. Where primary data are those that are gathered specifically for the given research question, in accordance with best practices for that question (Hox & Boeije, 2005). Secondary data is data that has been collected by others, e.g., other researchers, and that has been used for a different purpose, but that is reused for another purpose on a later stage (Hox & Boeije, 2005). The reason for using secondary data is to show previous findings on the topic and if found, make use of for instance frameworks or models found in literature.

The secondary data was collected using a mix of databases such as Google Scholar, Oria, Springer Link, Sage Journals and ABI/INFORM Global. Furthermore, various search terms were applied, but the most common ones were "Short Food Supply Chain", "Local Food Systems", "Sustainability", "Economic Sustainability", "Local Food Production", "Barriers", and "Sales Channels". The primary data for this thesis is collected using both a questionnaire and four semi-structured interviews. Using a convergent mixed method approach such as in this study, one has to take into account that both the quantitative and the qualitative data should include the same constructs, concepts and/or variables (Creswell & Creswell, 2018).

##### **4.4.1 Primary data: questionnaire**

Questionnaires are a common method of collecting primary data in written format, from a larger number of the population (Marshall, 2005). When using a questionnaire, all respondents answer to the same set of predetermined questions, which are in the same order for all respondents (Saunders et al., 2012). According to Marshall (2005), when designing the questionnaire, it is important to search the literature and seek if there are already established questionnaires that explore the same research topic. After searching for this, I did not manage to find any pre-existing questionnaires, and as a result the questionnaire for this study was made from start. A questionnaire is best used if the targeted respondents can be defined, when the respondents are known with what the questions ask, and when the analysis is going to be numerical, i.e., quantitative (Marshall,

2005). There are different types of questionnaires that a researcher could use. Among others there are postal/mail questionnaires, questionnaires delivered by hand to the individual respondents, i.e., delivery questionnaires, and web-based questionnaires (Saunders et al., 2012).

The questionnaire for this study can be defined as self-completed questionnaire (i.e., completed by the respondents them self and that is sent electronically), also known as web-based questionnaire (Saunders et al., 2012). Further, it was constructed using Nettskjema and consisted of six sections: (1) General information, (2) production, (3) Transportation/distribution/wholesaler, (4) Sales channels (5) Barriers (6) future. After dividing the sections, I had a scheduled meeting with Salgslaget AS where the aim was to find what they found to be the most important aspects for the producers in each section. The information retrieved from this meeting was used as the basis of forming the questionnaire, in addition to the use of existing literature to fill any gaps. Furthermore, there was used a mix of different types of questions such as closed questions, quantity question, list questions, category questions, scale questions based on Likert scale, and open questions (Marshall, 2005). The questionnaire was made in Norwegian to make it more comfortable for the targeted respondents (i.e., Norwegian local producers). The questionnaire can be found in appendix A.

Distribution of the questionnaire was also done with help from the cooperating company, Where both E-mail and Facebook was used to reach local food producers located in Norway. Together with the link of the questionnaire, the potential respondents received information about the core of the thesis and targeted respondents. The questionnaire was open between the period of 22<sup>nd</sup> of February and 13<sup>th</sup> of March, i.e., about three weeks. In the end I managed to receive 57 respondents. After collecting the data from the questionnaire, the constructs for the quantitative study were operationalized.

#### ***Operationalization of constructs for the quantitative data.***

To operationalize the constructs of the conceptual model (see figure 3-1) I have used questions from the following sections of the questionnaire: production, transport/distribution/wholesaler, sales channels, and barriers (both internal and external). According to Taherdoost (2019) a 7-point Likert scale is recommended. As such, the

indicators for the following constructs were measured using a 7-point Likert scale, ranging from “strongly disagree (1)” to “strongly agree (7)”: external barriers, internal barriers, imbalance of power in sales channels, and waste at production. The construct “number of economic operators in the SC” was measured with natural numbers from 0-7 to indicate how many economic operators used by each producer. Construct “Number of distribution options” is measured from 1-3, while the “economic sustainability” construct is measured from 1-6 (0-10% and increasing with 5 for each alternative). The operationalization of each individual construct is explained below and summarized in table 4-1.

*External barriers.* In the conceptual model, this is used as an independent variable. In this study it is defined as barriers outside the company that has the potential to hinder local food producers to be economic sustainable in the long run. The indicators for this construct were designed with inspiration from previous research, such as Balcom et al. (2023) and Nave and Do Paço (2021). According to Swain et al. (2008), the numbered response option (i.e., Likert scale 1-7) can in situations where it has been found that the wording of the question, does not match the scale anchors (e.g., Likert disagree/agree), be reversed. Meaning that instead of using the original scale from 1-7, the scale can be changed to 7-1. For this construct, the indicators were reversed in Excel (i.e., ranking from 1-7 were changed to 7-1). The construct is named EXTBAR and is measured by four indicators.

*Internal barriers.* This is an independent variable in the conceptual model. This variable is defined as barriers that could occur inside the producers’ company, and potentially be a hinder for either growth, or economic sustainability in the long run. Also here, the indicators for this construct were designed with inspiration from previous research from Balcom et al. (2023) and Nave and Do Paço (2021). The construct is named INTBAR and is measured by four indicators.

*Number of economic operators in SC.* In the conceptual model, this an independent variable. The variable is defined as the number of economic operators used in the SC, from producers to the end-consumers. This construct is measured by one single indicator. Bergkvist and Rossiter (2007) found that the use of single-item measures work best if the object of the attribute is concrete and uniformly imagined. The indicators for this

construct is designed from the definition of SFSC by Mancini et al. (2019, p. 1). This construct is named ECOP.

*Imbalance of power in sales channels.* For the conceptual model in this study, this is a mediating variable. The variable is defined as local food producers' position to the imbalance of power in the sales channels. The indicators for this construct were designed with inspiration from previous research, among others from Milford et al. (2021) and Richards et al. (2013) This construct is named IMBALANCE and is measured by three indicators.

*Producers' economic sustainability.* This is the dependent variable of the conceptual model. Straight forward it is defined as the economic sustainability of local food producers. This is also similar as the construct '*Number of economic operators in SC*' a single item construct (Bergkvist & Rossiter, 2007), and therefore measured with the use of one indicator. This construct targets the profitability of the respondent's company and is named ECOSUS.

*Number of distribution options.* This is defined as the number of different distribution options that are used by each production company. In this study there are three options: using large wholesaler companies, using smaller wholesale companies, or managing their own distribution in-house. This indicator is the sum of these options. The construct is named SUMDIST and has been used as a moderating construct for the constructs IMBALANCE and ECOSUS.

*Waste at production.* For the conceptual model, this is another mediating variable, and it is defined as the scale of waste from both raw materials and finished products for local food producers. The indicators for this construct were designed with inspiration from Bayir et al. (2022), where food waste was found an economic sustainability issue. As with the construct for *External barriers*, the indicators were reversed in Excel (i.e., the ranking from 1-7 were changed to 7-1. These indicators stem from the section of production in the questionnaire. The construct is measured by the two indicators about waste and is named WASTE.

Table 4-1 Operationalization of constructs.

<b>Constructs</b>	<b>Labels</b>	<b>Indicators</b>
External barriers (EXTBAR)	EXTBAR1	The regulations in the retail chains makes it difficult for us to get shelf position that we are satisfied with.
	EXTBAR2	It is difficult for us to get ahead with the marketing of locally produced products because it is too costly.
	EXTBAR3	The food chains and their own product brands have a lower price, which makes it difficult for us to compete with.
	EXTBAR4	We compete on 'green' food products that get a higher price than other products, this results in us not being able to sell our products in the retail stores.
Internal barriers (INTBAR)	INTBAR1	The challenge lies in being able to produce on a large scale, because we do not have the production capacity in terms of equipment and/or physical space.
	INTBAR2	We do not have storage capacity internally to be able to store the products while waiting for transportation.
	INTBAR3	We do not have enough resources (personnel) to be able to produce on a large enough scale as the retail chains want.
	INTBAR4	Our knowledge of the supply chain is too low for us as a producer to manage the distribution ourselves.
Number of economic operators in SC (ECOP)	ECOP1	How many economic operators are there in your supply chain (from producer to consumer)?
Imbalance of power in sales channels (IMBALANCE)	IMBALANCE1	There is a skewed distribution of power in the industry's sales channels.
	IMBALANCE2	It is difficult to get space in the sales channels that we want.
	IMBALANCE3	We are not satisfied with where the company is today.
Producers' economic sustainability (ECOSUS)	ECOSUS1	How much profit do you have?
Number of distribution options (SUMDIST)	SUMDIST1	SUM-DISTRIBUTION (summarized in Excel from three indicators) Q: How are your products distributed? <ol style="list-style-type: none"> <li>1. Through large wholesale businesses (e.g., REMA distribution, ASKO, or Coop Norge).</li> <li>2. Manages own distribution.</li> <li>3. Through smaller wholesale businesses.</li> </ol>
Waste at production (WASTE)	WASTE1	We have little wastage of raw materials.
	WASTE2	We have little wastage of finished products at the production site.

#### **4.4.2 Primary data: interviews**

In addition to the main self-complete questionnaire, four interviews were held to obtain additional viewpoints from informants in the industry. Interviews are conversations between two or more people used to gather information about a topic (Saunders et al., 2012). There are three primary types of interviews a researcher can use: structured interviews, unstructured interviews, and semi-structured interviews (Gill et al., 2008). The structured interviews can be explained as verbal questionnaires, where the interviewer has a set of predetermined questions, and where there is little to no variation nor follow-up questions. While unstructured interviews are informal and are usually performed with either little or no structure. The semi-structured interviews have a list of themes, and potentially several key questions, while there is also room for both the interviewer and the interviewee to go beyond, or outside the questions. Meaning that this is a flexible interview approach where the question order also may vary depending on the conversation (Gill et al., 2008; Saunders et al., 2012).

In this study I performed four semi-structured interviews, where the interview guide contained the same main themes as for the questionnaire (production, transportation/distribution/wholesalers, sales channels, barriers, and future), the only variation was the introduction question of the interview (i.e., questionnaire section “general information” was replaced with “description of local food industry”). The interview guide can be found in appendix B.

All the interview objects obtain high knowledge of the targeted industry (local food in Norway), with several years of experience working both in and with the Norwegian food sector. Before the interview, all interviewees received an information letter adapted from SIKT (SIKT, 2023) that was altered to suit this study, in addition to the interview guide. Furthermore, to preserve privacy for the interviewees, all agreed to be referred to as “interview object”. The relevant interview objects were found with help from Salgslaget AS, and contain people from the following categories: authorities, retail, network of experts for local food, and local sales channel. The interviews were conducted between the period of 23<sup>rd</sup> of February and 2<sup>nd</sup> of March through Microsoft Teams and lasted for approximately between 1 hour and 1,5 hours. Additionally, I used the Dictaphone app by Nettskjema to record the interviews, making the process of transcribing the interviews

easier. Since the participants are Norwegian, the interview guide, interviews and the transcripts were done in Norwegian. The finished transcript from all four interviews resulted in a Word document with 19 978 words and 32 pages.

## **4.5 Analytical approach**

Data analysis for studies with a convergent mixed method design is sectioned in three parts. Were the first being analysing the qualitative through coding and dividing it into themes, afterwards the quantitative data should be analysed with statistical results, and third both the results from the qualitative and the quantitative data should be merged, i.e., mixed method analysis (Creswell & Creswell, 2018). This step has been done as a side-by-side comparison, i.e., the interpretation which can be seen in the discussion section of the study (Creswell & Creswell, 2018). One difference from this three-step approach has been done, where instead of starting with the qualitative data, step one was the analysis of the quantitative data, and step two being the analysis of the qualitative data. The quantitative data has been analysed using a PLS-SEM analysis, while the qualitative data was analysed using a thematical analysis.

### **4.5.1 Quantitative data: PLS-SEM**

Different types of path analyses were first developed in the early 1920s' by Sewall Wright who was a biostatistician (Hair et al., 2011). Where path models are different diagrams that display visually both hypotheses and relationships of variables that can be studied when structural equation modeling (SEM) is applied (Hair et al., 2021).

SEM is a multivariate data analysis method (second generation), where one can visually examine different relationships among the chosen variables, also allowing latent variables that are hard to measure, to be included. Were latent variables also are known as factors or constructs that are underlying and that cannot be directly observed (Wong, 2013). Further, the indicators (also known as manifest variables or items) contain the raw data of the model and are the directly measurable variables. In path models, the latent variables are shown as ovals/circles, while the indicators are shown as rectangles (Hair et al., 2021).

The shown relationship both for the construct, and the indicators belonging to the construct, and from one construct to another, are depicted as arrows. In PLS-SEM the arrows represent direct relationships, and thus they are single headed (Hair et al., 2021).



Within SEM there mainly two distinctive approaches: either covariance-based SEM (CB-SEM) or partial least square – SEM (PLS-SEM), and although similar in some areas, there are still some distinct differences. Where CB-SEM is the most known and used, PLS-SEM is a newer approach, that over the past years has become more used within the field of SCM (Kaufmann & Gaeckler, 2015). PLS-SEM is known to work well with smaller sample sizes, while CB-SEM may need a larger sample size. According to Wong (2013) the minimum sample size should be from 52 and over. Since this study held a sample size of 57, the minimum requirement for PLS-SEM was fulfilled. Additionally, according to Hair et al. (2011) the minimum sample size should be ten times larger than the number of paths that is directed at a specific latent construct in the model. The largest number of structural paths in the structural model of this study is three. As such, the PLS-SEM method of analysis was used for the quantitative data, and I will therefor focus on this going forward.

PLS-SEM is a approach for causal modeling aiming at maximizing the explained variance of a dependent latent construct (Hair et al., 2011). In general, a PLS-path model has two elements: the structural model and the measurement models. In PLS-SEM these are known as the inner model and the outer model. The inner model links the different constructs together and shows the relationships (i.e., the paths) between the constructs. The outer model on the other hand, show the relationship between the constructs and the indicators (Hair et al., 2017). See figure 4-1, illustrating a simple path model.

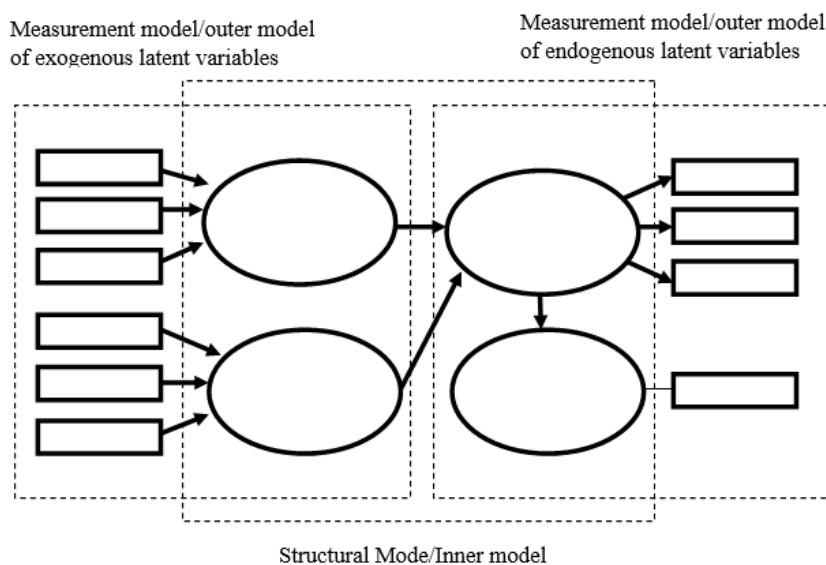


Figure 4-1 Simple path model – adapted from Hair et al. (2017)

In a path model such as PLS-SEM, one distinguishes between exogenous and endogenous constructs. The exogenous constructs i.e., the latent construct is the one that don't have structural path relationships, i.e., no arrows pointing at them. While the endogenous are the latent target constructs that are explained by the other constructs, i.e., have arrows pointing at them (Hair et al., 2011). Further, PLS-SEM distinguishes between formative and reflective measurement models (Hair et al., 2011; Hanafiah, 2020). Formative measurement model finds the latent construct to be caused by the observable indicators, which means that if a formative indicator is replaced it changes the meaning of the latent variable. The reflective measurement model specifies that either an unobservable or latent concept can cause variation in a group of observable indicators, which then will be used to give an indirect measurement of the concept. Further, the reflective indicators can to a certain point be interchangeable, and if necessary, removed (Hanafiah, 2020). This study holds a reflective measurement model. Figure 4-2 shows the differences between the two types of measurement models.

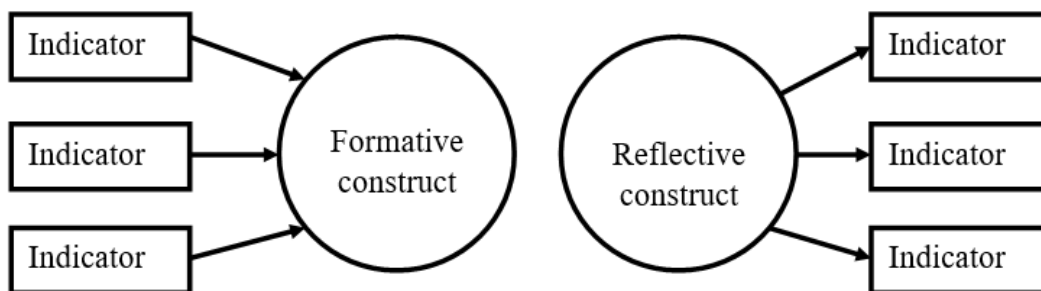


Figure 4-2 Difference between formative and reflective constructs – adapted from Hanafiah (2020).

### ***Assessment of the measurement models***

When assessing the final PLS-SEM model there are different criterion a researcher must look at. However, in PLS-SEM this has been divided according to either formative or reflective measurement models and/or constructs. If the model includes formative constructs, or if the model is formative only, a researcher must assess convergent validity, collinearity between the indicators, and the significance and relevance of the outer weights. On the other hand, if the model either includes or is reflective only, a researcher should assess the internal consistency reliability, convergent validity and discriminant validity (Hair et al., 2017). Since this study has a reflective measurement model, the belonging assessments will be further explained.

### *Internal Consistency Reliability:*

The traditionally used criterion for Internal Consistency Reliability is the Cronbach's alpha. This criterion gives an estimate on the reliability and is based upon the intercorrelations of the observed variables of the indicator (Hair et al., 2017). Cronbach's alpha has the assumption that the indicators are all equally reliable. However, since the Cronbach's alpha in general has the tendency to both underestimate internal consistency Reliability, in addition to being sensitive to the amount of items in the scale, Hair et al. (2017) recommended the use of composite reliability instead (i.e., rho\_A), which considers the various outer loadings of the indicator variables (Dijkstra & Henseler, 2015; Henseler et al., 2016). The values of composite reliability should be between 0.60 and 0.70 to be considered as sufficient (Hair et al., 2011; Hair et al., 2017).

### *Convergent Validity:*

Convergent validity is defined as "(..) *the extent to which a measure correlates positively with alternative measures of the same construct*" (Hair et al., 2017, p. 112). The indicators of a construct are used as alternative approaches for measuring the same construct. Meaning that the indicators of a construct should share a high proportion of variance (Hair et al., 2017). In order to evaluate the convergent validity of constructs one has to consider the outer loadings, in addition to the average variance extracted (AVE).

The outer loadings and its size are often called indicator reliability, and a rule of thumb is that it should be at least 0.708 or higher. However, it is not uncommon that there are weaker loadings, i.e., outer loading below 0.708. Instead of automatically removing the weaker outer loadings, researchers should examine the effect of removal on the composite reliability and content validity. Indicator that have outer loadings between 0.40 and 0.70 can be considered to be removed, but only if removal of the indicator leads to an increase of either composite reliability or AVE (Hair et al., 2017).

The average variance extracted (AVE) is a commonly used measurement to establish convergent validity on construct level. AVE should have the value of 0.50 or higher (AVE > 0.50), which indicates that on average, the construct is explained by more than 50% of the variance of the indicators (Hair et al., 2017).

### *Discriminant validity:*

The discriminant validity is the degree to which a specific construct is legitimately different from the other constructs according to empirical standards (Hair et al., 2017). This means that the checking the discriminant validity of the model is important, as it checks that each single construct is empirically distinctive, and is not represented by any of the other constructs in the model (Mwesiumo et al., 2021). To assess discriminant validity, both the Fornell-Larcker criterion and checking the cross loadings has often been used (Hair et al., 2017; Mwesiumo et al., 2021). Yet, Hair et al. (2017) argued that neither the Fornell-Larcker criterion, or the cross loadings reliably identifies issues with the validity. As such the Heterotrait-Monotrait ratio of correlations (HTMT) developed by Henseler et al. (2015) has been proposed as a remedy (Hair et al., 2017).

HTMT is an upper bound also known as a factor correlation estimate and should be significantly less than 1, in order to discriminate between two factors (Henseler et al., 2016). More precisely,  $HTMT > 0.90$  indicates lack of discriminant validity but a threshold value of 0.85 is considered justified (Hair et al., 2017).

In addition to these assessments, a measurement model could in some cases also include mediation constructs and/or moderating effects. The next sections will be used to explain this since both are included in the measurement model that has been used in this study.

### *Mediation effects:*

Mediation takes place when a third mediating variable occurs between two related constructs. Meaning that in PLS-SEM, when there occurs a change in the exogenous construct it leads to a change in the mediating variable, which in turn creates a change in the endogenous construct of the model. In short, this means that the mediating variable controls the underlying process between two constructs (SmartPLS, 2023a).

In PLS-SEM models, there can be either a simple mediator or multiple mediators (see figure 4-3).

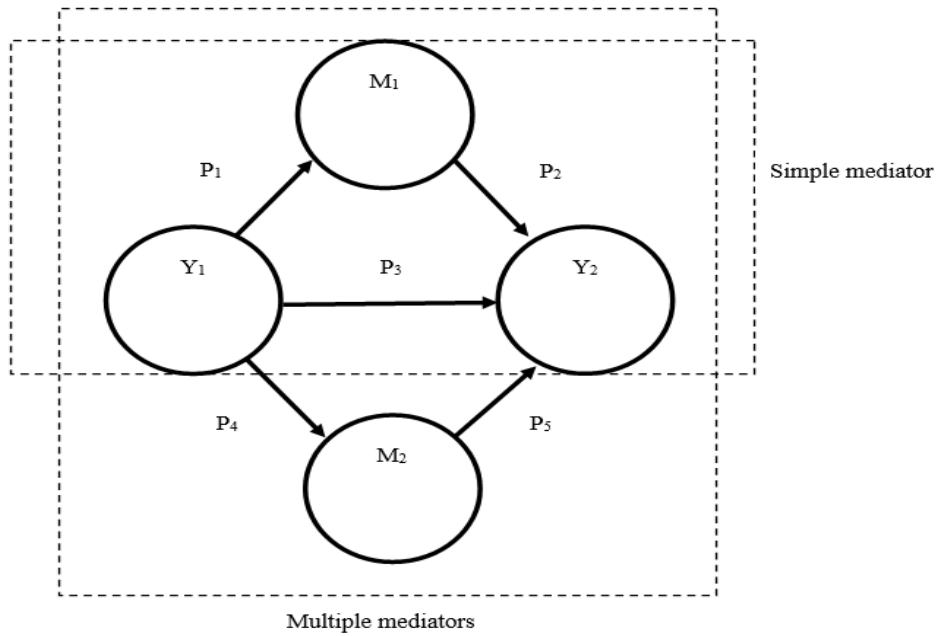


Figure 4-3 Illustration of simple and multiple mediators. Adapted from SmartPLS (2023a).

To analyse a structural model with mediating constructs, Zhao et al. (2010) has proposed the following figure (figure 4-4).

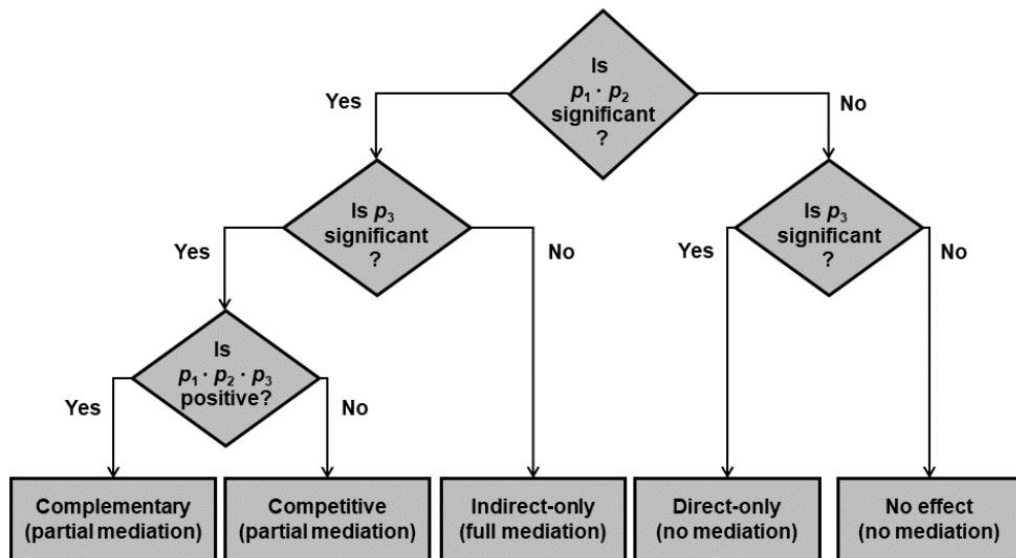


Figure 4-4 Analysing mediation effects. Retrieved from SmartPLS (2023a).

From this model, they found that in complementary mediation, both the mediated effect  $p_1 \times p_2$  and the direct effect ( $p_3$ ) is significant, and both either positive or negative. In competitive mediation, both the effect  $p_1 \times p_2$  and the direct effect ( $p_3$ ) is significant, but they point in opposite directions (e.g., one positive and one negative). Indirect – only mediation has a significant  $p_1 \times p_2$ , but there is no direct effect. Further, in direct – only,

non-mediation, the direct effect is significant, but not the indirect effects. Lastly, for the no – effect, non-mediation, there is no significant effect for neither the direct, nor the indirect effect (Zhao et al., 2010). This model is also used for models with multiple mediating constructs (SmartPLS, 2023a).

*Moderating effects*

Moderation refers to a scenario where the relationship between two different constructs is determined by a third variable (i.e., the moderator construct). The third construct modifies the strength and/or direction of the relationship between the two non-moderating constructs (SmartPLS, 2023b). Figure 4-5 illustrates the moderating construct. The interaction term, which is the result of the moderator and predictor variables, is used to evaluate the moderating relationship. This is done by determining if changes to the moderating construct, increase or reduce the strength of the focus relationship. In PLS-SEM one can assess this effect through a simple slope plot. (SmartPLS, 2023b).

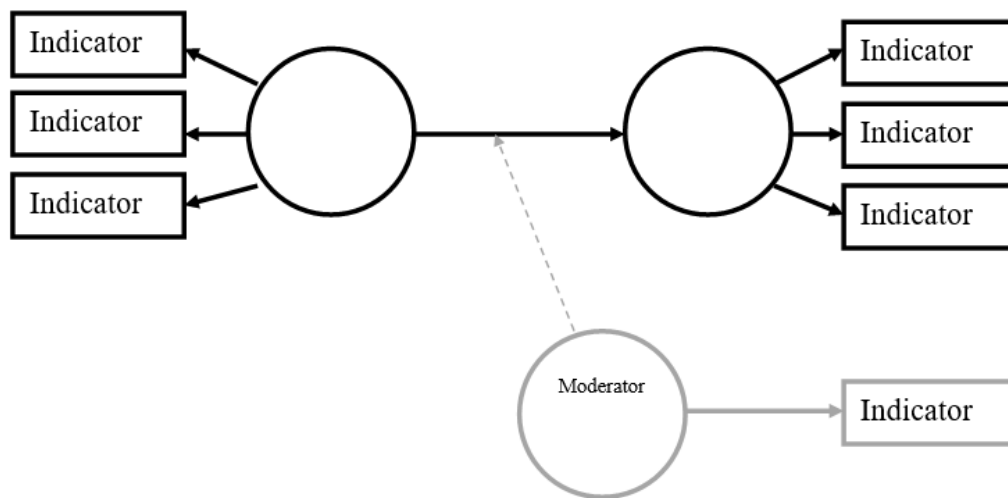


Figure 4-5 Illustration of moderating construct.

Moreover, in this study, the coefficient of determination, and the adjusted coefficient of determination were used in to evaluate the structural model. The following will therefore describe both.

*The use of R-square and Adjusted R-square.*

The coefficient of determination (i.e., R-square =  $R^2$ ) is commonly used as a measure to evaluate the structural model.  $R^2$  measures the amount of variance in the endogenous

constructs, that is explained by all the exogenous constructs that are linked to it. Meaning that, it is a measure of the predictive ability of the model. The  $R^2$  coefficient thus represents the combined effects of the exogenous latent variables, on the endogenous latent variable, measuring the structural model's predictive power. In research, values of 0.25, 0.50, and 0.75 are considered weak, moderate and substantial (Hair et al., 2017). Further, in order to prevent biases towards complex models, the adjusted coefficient of determination (i.e., Adjusted R-Square =  $R^2_{adj}$ ) is frequently used as a criterion. Regarding both the sample size and the number that describes the constructs, the value of  $R^2_{adj}$  reduces the value of  $R^2$ . As a result, this compensates for the addition of exogenous structures that are not significant in order to raise the explained variance  $R^2$  (Hair et al., 2017).

Finally, the bootstrapping process is essential for testing the model and thus the hypotheses. Considering this, an explanation is provided below.

#### *Bootstrapping and hypothesis*

In PLS-SEM the data is not assumed to be normally distributed (Hair et al., 2017). In SmartPLS and for PLS SEM analysis, the bootstrap is explained as a non-parametric inferential technique that is based upon an assumption that the population distribution is reflected by the sample distribution (Henseler et al., 2016, p. 5). Bootstrapping is a process/procedure where it is drawn many bootstrap-samples, that again are drawn from the original sample including replacement of these. The replacement is done were for each time an observation is drawn from the random sample population (i.e., 57 local food producers in the case of this study), it still contains all the same elements, i.e., the observation is returned before the next observation is gathered (Hair et al., 2017).

The recommended number of bootstrap is 5 000 (Hair et al., 2017), but there is also seen use of 10 000 in for instance Dijkstra and Henseler (2015). However, since this study has a rather small sample size (57 respondents), a 5000 bootstrap was too large. Meaning that all p-values and t-statistics were found to be 0.000. Thus, this study has used a 500 bootstrap to accommodate the smaller sample size in the study. The bootstrap-samples are then used to find the standard errors in order to perform the hypothesis testing, this is done with a student's t-test to check the null hypothesis (Hair et al., 2011). See appendix C table 18-1 for the bootstrap settings used in this study.

When using statistical hypothesis there is always both a null hypothesis (hypothesis zero or H<sub>0</sub>) and an alternative hypothesis (H<sub>A</sub>). The alternative hypothesis can be a claim of either systems, populations, or reality, while H<sub>0</sub> represents the opposite of H<sub>A</sub> (Arntzen, 2021, p. 84). In this study there are eight alternative hypotheses (H<sub>1</sub>-H<sub>8</sub>) that all have their own H<sub>0</sub>.

#### **4.5.2 Primary data: interviews**

One of the most frequently used approaches for analysing qualitative data is thematic analysis (Bryman & Bell, 2015; Castleberry & Nolen, 2018). Thematic analysis is an approach to identify, analyse, and report themes and/or patterns from gathered data. It is explained as a descriptive and flexible method which decrease the amount of data, while keeping it comparable with other data analysis methods (Castleberry & Nolen, 2018). As such, the qualitative data in this study were analysed using thematical analysis method. The analysis used the framework by Castleberry and Nolen (2018, pp. 808-812).

The interviews for this study were transcribed “by hand” using Microsoft word.

Transcription i.e., compiling is the first step in the framework, and it is recommended to do this process yourself as it increased the closeness to the data and therefore can jumpstart the analysis process (Castleberry & Nolen, 2018).

After the phase of transcribing, the next step is to disassemble the data. This was done with the use of coding, where coding in qualitative data analysis is defined as “*the process by which raw data are gradually converted into usable data through the identification of themes, concepts, or ideas that have some connection with each other*”(Castleberry & Nolen, 2018, p. 808). In this study, I printed out the transcripts on paper, and wrote the codes by hand in the margin. This was done to become more familiar with the content of the transcripts.

Since the interviews and the interview-guide already were divided 6 sections, the coding of the transcripts followed these themes. This became natural since the interviews followed the flow of the conversations, i.e., not always according to the prepared semi-structured interview guide.

The third step is to reassemble the data from the codes and themes (Castleberry & Nolen, 2018). This was done by following a matrices set up through arranging the four participants answers in each theme side-by-side, to give a visual representation of the



findings (Castleberry & Nolen, 2018). The fourth step is to interpret the data. This was done using the matrix set up, which allowed for finding connections, similarities, disagreements and more, in order to see them in connection to, and in connection with one another (Castleberry & Nolen, 2018). The last step of the framework is the conclusion (Castleberry & Nolen, 2018). However, since this study is based upon a mixed method approach, the conclusion is based upon both the quantitative and the qualitative analysis.

#### **4.6 Validation and reliability**

In convergent mixed method approaches, validity should be established for both quantitative data (construct validity) and qualitative data (triangulation) (Creswell & Creswell, 2018). When using an convergent approach, some issues such as sample size differences, and difference in type of participants can arise (Creswell & Creswell, 2018). As previously mentioned, the quantitative data has a sample size of 57 local food producers, while the semi-structured interviews have a sample size of four participants from different parts of the industry. Meaning that in this study there is a large difference in sample size of the two primary data. However, because of the nature in this thesis, where the focus of the study are the producers (quantitative data), which has the largest sample size, and the focus of the interviews revolved around the producers, in addition to the industry for the local food producers, this is argued to be acceptable.

The different types of participants were also carefully selected to avoid biases, and to rather see several perspectives for the producers. Additionally, both the questionnaire and the interview-guide contained the same main themes. This contributes to confirming validity despite the different sample size and participants. Further, the use of different perspectives and methods can be referred to as triangulation. Where triangulation can be explained as using more than one type of data and/or method for the same study (Bryman & Bell, 2015). The use of triangulation is found to increase confidence in findings and therefor also the validity and reliability (Bryman & Bell, 2015). In this thesis, the interviews were seen in connection with the eight hypotheses, meaning that the triangulation has contributed to increasing both the validity and reliability of the study.

## 5.0 Conclusion

This thesis aimed at examining local food producers' economic sustainability, and to seek how internal and external factors affects their profitability (and thus the economic sustainability). The study has used a more holistic model compared with previous research, where the factors often have been researched separately. E.g., imbalance in the sales channels (see e.g., Richards et al., 2013), or economic sustainability in SFSC (see e.g., Malak-Rawlikowska et al., 2019). To investigate the problem, I used a convergent mixed method; PLS-SEM and interviews.

The analysis statistically confirmed that; when the number of economic operators used in the total SC increases, producers' position to the imbalance of power in the sales channels also increases. In addition, it has also been statistically confirmed that the producer's position of the imbalance in the sales channels, has a negative effect on their economic sustainability. Thus, an imbalance of power in the sales channels, has a negative impact on producers' economic sustainability. Further, the study confirmed that the external barriers have a negative effect on both producers' economic sustainability, and their position to the imbalance of power in the sales channels. Yet only the latter has been statistically confirmed. This means that, although not statistically significant, the external barriers are found to have a negative impact on the economic sustainability of the local food producers.

Moreover, although not statistically confirmed, there was also found positive effects from internal barriers to both producer's position to the imbalance of power in the sales channels and waste at production. In addition, the waste in production was found to have a weak but negative effect on the economic sustainability. However, this result was not statistically confirmed. Lastly, the study did not statistically confirm that the number of distribution options used by producers, strengthens the effect of the imbalance in the sales channels to producers' economic sustainability.

## 6.0 Research summary

This study aimed to investigate local food producers' economic sustainability. To do so, I investigated the impact of the following six variables: external and internal barriers, the number of economic operators' producers have in their supply chain, the imbalance of power in the food industry, number of distribution options and waste at production.

For this study there was made eight hypotheses, which were derived from previous research. The main literature review included different theory. Firstly, Short Food Supply Chains, which in this study has been used as the supply chain of locally produced food. Second, literature about the sales channels gave an insight about how the imbalance of power is divided across the industry. Third, the economic sustainability provided the context to the local food producers. Lastly, previous studies about barriers, provided insight for external and internal barriers, that local food producers may come across when working towards economic sustainability.

In this study, the level of analysis was Norwegian local food producers, and the research setting has been Norway. The study held a deductive research approach, since the theory had been gathered in the beginning, and where the goal was to test the hypotheses derived from found literature. Further, the study was based upon a convergent mixed method; where both quantitative and qualitative data had been gathered around the same time and later integrated through the study. Moreover, the questionnaire was defined as a self-complete questionnaire, and consisted of six different sections, answered by 57 local food producers. Before testing the structural model, a conceptual model was made, showing the anticipated relationships between all seven variables. On the other hand, the interviews conducted have been defined as semi-structured interviews. The study conducted four interviews with professionals in the food industry. The interview guide followed the same themes as the questionnaire, with exception for the introductory question.

The quantitative data was analysed with the use of Partial least squares structural equation modeling (PLS-SEM), and to do so the software SmartPLS 4 had been used. The structural measurement model in this study used reflective constructs only. Based upon that, the assessment of the measurement model included: internal consistency reliability, convergent validity, and discriminant validity. Additionally, the structural model included

both multiple mediation analysis and one moderating effect. Furthermore, to test the eight hypotheses in the study, a 500 bootstrap was run to accommodate for the smaller sample size in this study. The qualitative data retrieved from the four semi-structured interviews, was analysed by following a five-step thematic analysis including the following: transcription, coding of transcript, reassemble of data in a matrix, data interpretation and conclusion. This setup was altered to suite the mixed method approach.

The study statistically confirmed three out of eight hypotheses, while the interviews “supported” seven of the hypotheses, i.e., including the hypotheses that were not statistically confirmed. The results from this study showed that H1, H2 and H4 were statistically confirmed, and that H1 had a positive path coefficient, while H2 and H4 had negative path coefficients. These three hypotheses were also supported from the interview findings.

Further, neither H3 nor H5 were statistically confirmed, however both were found to have a negative path coefficient, which was consistent with the hypotheses. Additionally, interview results supported both hypotheses. H3 was the moderating construct in the model. From the moderating slope analysis, it did show that an increase in the construct resulted in a stronger negative relationship between the mediating construct and the dependent construct. Further, neither H6, H7 nor H8 were statistically confirmed. However, both H6 and H8 had a positive path coefficient, while H7 had a negative path coefficient. Meaning that the three path coefficients matched the predicted hypotheses. Additionally, both H7 and H8 were supported from the interview results.

In conclusion, this study did statistically confirm that, when the number of economic operators used in the total SC increases, producers’ position to the imbalance of power in the sales channels also increases. In addition, it was statistically confirmed that the producer’s position of the imbalance in the sales channels, has a negative effect on their economic sustainability. Further, external barriers have a negative effect on both producers’ economic sustainability, and their position to the imbalance of power in the sales channels. Yet only the latter has been statistically confirmed. Moreover, although not statistically confirmed, there was also found positive effects from internal barriers to both producer’s position to the imbalance of power in the sales channels and waste at

production. In addition, the waste at production was found to have a weak, but negative effect on the economic sustainability. However, this result was not statistically confirmed. Lastly, the study did not statistically confirm that the number of distribution options used by producers, strengthens the effect of the imbalance in the sales channels to producers' economic sustainability.

## **6.1 Limitations of the study and managerial implications**

Since the research setting was Norway, while the main level of analysis were Norwegian local food producers, this study was limited to Norway. Further, the quantitative analysis consists of a relatively small sample size with 57 respondents, although within the minimum limit of 52 by Wong (2013). This means that the structural model could have gained more accurate results if I had managed to obtain a larger sample size, and thus also could have run at least a 5.000 bootstrap sample, which is the recommended bootstrap by Hair et al. (2017).

## **6.2 Suggestions for further research**

Since this study did not include a hypothesis to test the effect of the internal barriers on the economic sustainability, a suggestion for further research could be to test that relationship. In addition, as it through the interviews was discovered that medium sized local food producers often fall between when it comes to distribution, it could be interesting for further research to see how the distribution could be improved for the medium-sized producers. Yet, without it going beyond the economic sustainability of the producers.

## **7.0 Research paper.**

# **Economic sustainability for local food producers: A case study of Norway.**

By: Natasha van der Linden

### **7.1 Abstract**

This study aimed to investigate local food producers' economic sustainability. To do so, I investigated the impact six variables: external and internal barriers, the number of economic operators' producers have in their supply chain, the imbalance of power in the food industry, number of distribution options, and waste at production. The investigation was based upon a mixed method: questionnaire and interviews. The data was collected using a self-complete questionnaire answered by 57 local food producers across Norway, and with four semi-structured interviews with professionals in the food industry. The quantitative data has been analysed with the use of PLS-SEM, and the qualitative data has been analysed using a thematical analysis. The study has statistically confirmed three out of eight hypotheses. These three have shown that when the number of economic operators in the supply chain increases producers' position to imbalance in the sales channels also increases. In addition, the imbalance of power in the sales channels has a negative effect on the economic sustainability, and external barriers have a negative effect on the imbalance of power in the sales channels. The interviews, however, supported seven of the hypotheses, though four of which were not significantly supported.

### **7.2 Keywords**

Local food producers – Norway – Short food supply chain (SFSC) – Economic sustainability – Imbalance of power – Barriers – Waste – PLS-SEM – Semi-structured interviews – Convergent mixed method.

## 8.0 Introduction

In Norway the local food sales have increased from 11,2 billion NOK in 2021 to 11,5 billion in 2022 (Government, 2022b), showing an increased interest in locally produced food, and according to a report from the Norwegian Food Authority (2021), the large retailers have seemingly also increased their interest for locally produced food. In the Norwegian market, the governmental food policies are said to cover the entire supply chain (SC), where their main objective is to safeguard the supply chains in to be most possibly safe, sufficient, and with reasonable prices with high quality food (Government, 2022a). Yet, the retailers who sell the finished food products to the end consumers are the ones that often get away with the highest profits. Norway stands out from the other countries in Europe by the high concentration of power in the grocery industry, and in the latest years the retailers have increased the vertical integration in the sector, by ‘forcing’ cooperation in the wholesaler sector (Norwegian farmer organization, 2022).

The global food systems (GFS) have over the last decades been seen as unsustainable due to the responsibility for food waste, environmental damages through overuse and increased waste, in addition to a skewed and unfair allocation of received value among the different actors through the supply chain (Mancini et al., 2019). Throughout the literature there have been several studies about the local food supply chain under different names, but often in the perspective of short food supply chains (SFSC) (See e.g., Abate-Kassa & Peterson, 2011; Campos et al., 2021; Doernberg et al., 2022; Mancini et al., 2019). SFSC focuses among others on a reduction of economic operators in the total supply chain, of locally produced food (Malak-Rawlikowska et al., 2019), which in turn through studies has been found to improve the economic sustainability for local food producers (Renkema & Hilletoft, 2022). Further, recent events such as the Covid-19 pandemic and war, has increased the discussions and realizations about the importance of local food production (Alsetoohy et al., 2021; Ben Hassen & El Bilali, 2022; Hobbs, 2020; Jones et al., 2022). Despite this, there is little research on how factors such as: SFSC, imbalance of power and internal and external barriers, together impact the local food producer’s economic sustainability. This paper aims to provide knowledge to this field by investigating the following three research questions:

**RQ1:** Does an imbalance of power impact producers' economic sustainability?

**RQ2:** What is the impact of producer's external barriers on their economic sustainability?

**RQ3:** What is the impact of producer's waste on their economic sustainability?

To answer these research questions, this study used a mixed method. First, a questionnaire answered by 57 respondents, and second interviews from four interview objects. The questionnaire was analysed using Partial least squares structural equations modeling (PLS-SEM), and the interviews were analysed using a thematical analysis. The hypotheses for PLS-SEM are based on previous research literature.

## **9.0 Literature review and hypotheses**

The origin of SFSC's began with the study by Marsden et al. (2000), who divided it in three types of SFSC: face-to-face, spatial proximity and spatially extended. Ilbery and Maye (2005) found that the key characteristics of all three groups are that all food products reach the end-consumer after passing through a SC, containing valuable information about the mode of production, the origin of the product, and unique quality assets of the food product. Further, Loconto et al. (2018) meant that SFSC either can be seen in physical distance or through cognitive distance, and based it on the total number of actors (i.e., economic operators) from production and to the consumer. When searching for literature findings, one can see that both direct and short chains for local food, often times are used as synonyms that merge both direct sales and mediate sales, i.e., sales through restaurants, stores and similar (Renkema & Hilletoft, 2022; Rogers & Fraszczak, 2014).

Since the local food supply chains mainly are researched through SFSC and that the term in general is used to describe the supply chain of local food products (Abate-Kassa & Peterson, 2011; Campos et al., 2021), I have used this term in the paper. SFSC have been defined by Mancini et al. (2019, p. 1) as *"(...) involving a limited number of economic operators, committed to co-operation, local economic development, and close geographical and social relations between producers, processors and consumers"*.

There are several previous studies that have found both drawback and advantages for local producers when it comes to the choice of sales channels, i.e., marketing channels (Milford



et al., 2021). Kim et al. (2014) compared the risk and return factors of selling through farmers markets versus selling through what they referred to as wholesale market channels in the US, i.e., what Milford et al. (2021) refers to as mainstream wholesalers. In this study they found that reasons for selling through a mainstream wholesaler was transparent pricing (Milford et al., 2021). While a study by Hardesty and Leff (2010) found that there were lower marketing costs for the producers by selling through wholesalers. Further, LeRoux et al. (2010) found through their study, that producers selling through farmers markets had the possibility for gaining a higher net sales income than selling through wholesalers. Meaning that as with all else, there are both drawbacks and advantages with all types of sales channels (i.e., sales market) depending on the producers and their opportunities, goals, knowledge and more.

Between 1980's and 1990's there was a large restructuring of the retail section in Norway. According to Kjuus (2010) this resulted in the making of a larger concentration of power in the food chains. This made it more difficult for the producers to gain access to the retailers store shelves (Richards et al., 2013). Although these studies are more than 10 years old, and the industry is in continuous change, the Norwegian retail market is still known to be concentrated around just a few retail chains. For example, umbrella chains, where the wholesale market for these sectors are found to be classified as either oligopolies or duopolies. This was found to be a direct result the umbrella chains that often cooperate as both wholesalers and processors (Milford et al., 2021). In addition, it is known that there is a limited number of distribution channels that the producers have the possibility to choose from (Amilien, 2011). This means that although there are many different transportation companies, one could say that there are mainly three options: distribution through wholesalers owned by the umbrella chains, producers arranging their own distribution or the use of some smaller distributors. In addition, the more distribution channels producers could choose between, the more options there are for SFSC. It could be that some of the channels have more convenient pick-up services, or they are less expensive. Further, the composition of the distribution providers used by producers, may also have a positive impact on pricing.

In the literature it has been argued that the increased imbalance of power has led local food producers in to an "arm-lock", where producers are potentially forced out from key sales

channels (e.g., larger retailers). In turn, this could be a result of the governing of the large chains by keeping high private standards, in addition to a rationalisation of the biases in the industry (Amilien, 2011; Richards et al., 2013).

Based upon this, I propose the three following hypotheses:

**H1:** The number of economic operators in the supply chain, is associated with the producers' imbalance of power in the sales channels.

**H2:** The imbalance of power has a negative effect on producers' economic sustainability.

**H3:** The Number of distribution options strengthens the effect of imbalance of power to producers' economic sustainability.

## **9.1 Economic sustainability and barriers**

Economic sustainability in the context of Food Supply Chains (FSC) concerns the viability and the competitiveness of the actors in the SC and relates to the increased opportunities for improved income for all actors involved, in addition to the job creations that again leads to increased value creation in society (Muhammad Kaleem et al., 2022; Vittersø et al., 2022). In short, one could therefore claim that economic sustainability concerns the viability of different local food producers. Additionally, within the context of SFSC's economic sustainability may be improved as producers have the possibility to increase value of their product through limited numbers of economic operators (i.e., intermediaries) (Renkema & Hilletoft, 2022).

There are challenges within the SC that affect the extent to which local food producers have the opportunity to achieve economic sustainability. According to Laurett and do Paço (2018) barriers can be seen as problems and/or situations that prevent an activity or action from being carried out. Meaning that a barrier can be either a situation or a problem that makes a specific something more challenging. Barriers that local food producer both can and may be exposed to can be split into internal and external barriers.

The external barriers that local food producers may be exposed to at some point can be categorized in groups related to such as: too little knowledge about technology, problems with infrastructure, legislative problems, and lack of support policies. Additionally, producers may face external barriers regarding market access, such as the difficulties with selling their products to grocers that could offer lower prices according to smaller

businesses, and if not they would face loss of revenue in the long term (Balcom et al., 2023; Nave & Do Paço, 2021). As such, the two hypotheses follow:

**H4:** Producers' external barriers is associated with the imbalance of power in the sales channels.

**H5:** Producers' external barriers is negatively associated with producers' economic sustainability.

Local food producers wont exclusively face external barriers from the outside of the company, in many cases there are several internal barriers that the company could be exposed to. Nave and Do Paço (2021) found that a lack of both material and human resources; lack of knowledge and information, financial constraints and difficulties for company change, to be common internal barriers faced by producers. Additionally, the difficulties for market access is not only based upon external barriers as the difficulties such as with producers selling their own products through own sales channels, e.g., farmers market face challenges regarding the initial setup costs and finding suitable storage and location for their products (Balcom et al., 2023). From this I have made the following hypothesis:

**H6:** Internal barriers of local food producers have a positive effect on the imbalance of power in the sales channels.

Further, when it comes to the internal barriers for economic sustainability, one aspect could be the waste in production (i.e., raw materials and finished products). In a study by Bayir et al. (2022) food waste was considered as among others an economic sustainability challenge. Which is not surprising since food products that are either thrown away because of either expiration dates, quality or similar, or remains of ingredients that are not used further in the production, is potential loss of revenue for the company. From this I have made two hypotheses:

**H7:** Producers waste in production has a negative effect on producers' economic sustainability.

**H8:** Internal barriers effect the waste in production.

## **10.0 Methods and Data**

This chapter presents the main methodological choices from the thesis. Including the following: level of analysis and research setting, research approach, strategy, and data collection and design, in addition to explanation of the constructs used in the PLS-SEM analysis.

### **10.1 Level of analysis:**

Across Norway there are about 516 local food producers that are registered with a valid self-audit and have through that confirmed that the production is according to Norwegian regulations for safe food (Norwegian food foundation, 2023). In this study the main target respondents were Norwegian local food producers.

### **10.2 Research settings**

The setting of this study is Norway. The latest years local food producers in Norway have had major challenges associated with the price increases, increasing cross-border trade and the closure of society, but despite this the sales of locally produced products has increased from 11.2 billion NOK in 2021 to 11.5 billion NOK in 2022 (Government, 2022b). This study's targeted respondents are local food producers in Norway. Additionally, I have included four respondents that are well familiar with the local food industry from four different point of views, with the primary focus on the producers and the focus industry of this study. Since this study is done in cooperation with Salgslaget AS, I gained help from the company with both reaching out to the producers them self, in addition to finding the right target respondents for the extra interviews.

### **10.3 Research approach, strategy, and data collection:**

This study is based upon a convergent mixed method approach (Creswell & Creswell, 2018), and the paper holds a deductive research approach (Saunders et al., 2012), where the goal is to test the model. The quantitative data was collected with a self-complete questionnaire, while the qualitative data of this study was gathered by conducting four semi structured interviews.

The questionnaire was open between the period of 22<sup>nd</sup> of February and 13<sup>th</sup> of March, i.e., about three weeks. With help from Salgslaget AS it was distributed to the targeted

respondents for the study, to obtain a relevant sampling. In the end I managed to receive 57 respondents on the questionnaire. Additionally, through the contacts from Salgslaget AS I found four interview objects relevant for the interviews, containing people from the following categories: authorities, retail sector, network of experts for local food, and local sales channel. The reason for using method triangulation including respondents outside of the original target, has been to gather more insight from the industry, as this industry contains several different perspectives. The interviews were conducted between the period of 23<sup>rd</sup> of February and 2<sup>nd</sup> of March through Microsoft Teams and lasted for approximately between 1 hour and 1,5 hours. All the interview objects obtain high knowledge of the targeted industry, with several years of experience working in the food sector. Yet, due to the privacy of the interview objects, they will not be named in this study.

### 10.3.1 Operationalization of constructs for the quantitative analysis.

To operationalize the constructs of the model I have used questions from the following sections of the questionnaire: production, transport/distribution/wholesaler, sales channels, and barriers (both internal and external). Indicators for the following constructs were measured using a 7-point Likert scale (Taherdoost, 2019) external barriers, internal barriers, Imbalance of power in sales channels, and Waste at production. The construct “number of economic operators in the SC” was measured on with natural numbers from 0-7 to indicate how many economic operators used by each producer. Construct “Number of distribution options” is measured from 1-3, while the economic sustainability construct is measured from 1-6 (0-10% and increasing with 5 for each alternative). The operationalization of the individual constructs is explained bellow.

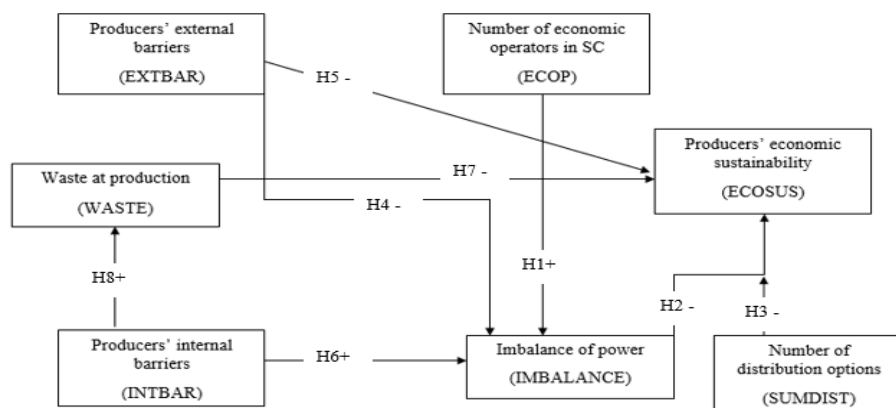


Figure 10-1 Constructs and hypotheses.

*External barriers.* In the conceptual model, this is used as an independent variable (see figure 10-1). In this study it is defined as barriers outside the company that has the potential to hinder local food producers to be economic sustainable in the long run. Because of the wording used in the four indicators (see table 10-1), the indicators were reversed in Excel (i.e., ranking from 1-7 were changed to 7-1). Originally, the questionnaire had 5 questions in this category. However, following the rules of Hair et al. (2017) a indicator should be considered to be removed from the construct, if the removal leads to an increase of either the composite reliability or the AVE. The construct is named EXTBAR and is measured by four indicators, i.e., one indicator was removed from the construct.

*Internal barriers.* This is an independent variable in the conceptual model. Operationally, this variable is defined as barriers that could occur inside the producers' company, and potentially be a hinder for either growth, or economic sustainability in the long run. The construct is named INTBAR and is measured by four indicators.

*Number of economic operators in SC.* In the conceptual model this an independent variable. The variable is defined as the number of economic operators used in the SC, from producers to the end-consumers. This construct is measured by one single indicator. Bergkvist and Rossiter (2007) found that the use of single-item measures work best if the object of the attribute is concrete and uniformly imagined. This construct is named ECOP.

*Imbalance of power in sales channels.* For the conceptual model in this study, this is a mediating variable. I have defined this variable as local food producers' position to the imbalance of power in the sales channels. Originally the questionnaire had 5 questions in this category measured with Likert. However, same as for the construct "*External barriers*", also here the rules of Hair et al. (2017) were followed. As such, the construct is measured by three indicators i.e., two indicators were removed from the conceptual model. This construct is named IMBALANCE.

*Producers' economic sustainability.* This is the dependent variable of the conceptual model. Straight forward it is defined as the economic sustainability of local food

producers. This is also similar as the construct ‘*Number of economic operators in SC*’ a single item construct (Bergkvist & Rossiter, 2007), and therefore measured with the use of one indicator. This construct targets the profitability of the respondent’s company, and the construct is named ECOSUS.

*Number of distribution options.* This is defined as the number of different distribution options that are used by each production company. There are three options: using large wholesaler companies, using smaller wholesale companies, or managing their own distribution in-house. This indicator is the sum of these options. The construct is named SUMDIST and has been used as a moderating construct for the constructs IMBALANCE and ECOSUS.

*Waste at production.* For the conceptual model, this is another mediating variable, and it is defined as the scale of waste from both raw materials and finished products for local food producers. These indicators stem from the section of production in the questionnaire. Because of the wording in the two indicators (see table 9-1), the indicators were reversed in Excel (i.e., ranking from 1-7 were changed to 7-1). This construct is measured by the two indicators about waste and is named WASTE.

Table 10-1 Operationalization of constructs.

<b>Constructs</b>	<b>Labels</b>	<b>Indicators</b>
External barriers (EXTBAR)	EXTBAR1	The regulations in the retail chains makes it difficult for us to get shelf position that we are satisfied with.
	EXTBAR2	It is difficult for us to get ahead with the marketing of locally produced products because it is too costly.
	EXTBAR3	The food chains and their own product brands have a lower price, which makes it difficult for us to compete with.
	EXTBAR4	We compete on 'green' food products that get a higher price than other products, this results in us not being able to sell our products in the retail stores.
Internal barriers (INTBAR)	INTBAR1	The challenge lies in being able to produce on a large scale, because we do not have the production capacity in terms of equipment and/or physical space.
	INTBAR2	We do not have storage capacity internally to be able to store the products while waiting for transportation.
	INTBAR3	We do not have enough resources (personnel) to be able to produce on a large enough scale as the retail chains want.
	INTBAR4	Our knowledge of the supply chain is too low for us as a producer to manage the distribution ourselves.
Number of economic operators in SC (ECOP)	ECOP1	How many economic operators are there in your supply chain (from producer to consumer)?

Imbalance of power in sales channels (IMBALANCE)	IMBALANCE1	There is a skewed distribution of power in the industry's sales channels.
	IMBALANCE2	It is difficult to get space in the sales channels that we want.
	IMBALANCE3	We are not satisfied with where the company is today.
Producers' economic sustainability (ECOSUS)	ECOSUS1	How much profit do you have?
Number of distribution options (SUMDIST)	SUMDIST1	SUM-DISTRIBUTION (summarized in Excel from three indicators) Q: How are your products distributed? 1. Through large wholesale businesses (e.g., REMA distribution, ASKO, or Coop Norge). 2. Manages own distribution. 3. Through smaller wholesale businesses.
	WASTE1	We have little wastage of raw materials.
	WASTE2	We have little wastage of finished products at the production site.

## 11.0 Hypothesis testing

### 11.1 Quantitative data

The quantitative data is analysed using PLS-SEM and the software SmartPLS 4 (SmartPLS4, 2023). According to Wong (2013), the minimum sample size required to use PLS-SEM is 52. The quantitative section of this study holds a sample size of 57, thus the study has satisfied the minimum requirement for observations. In this study the constructs are composite, in the sense that the character of each construct is represented by their indicators, meaning that PLS-SEM is suitable for this analysis (Hair et al., 2011; Richter et al., 2016). Additionally, the sample size fits the ten times larger requirement (see Hair et al., 2011, p. 144).

#### 11.1.1 Assessment of the measurement model

In this study I have used a reflective measurement model, and when using these kinds of models, one has to thoroughly examine both the reliability and validity (Haenlein & Kaplan, 2004; Wong, 2013).

##### *Internal consistency reliability and convergent validity:*

Internal consistency reliability is a measure used for the assessment of the reliability for the scores of the PLS constructs, and the recommended measure is rho\_A (ρA) (Dijkstra & Henseler, 2015; Henseler et al., 2016). Additionally, the recommended criterion for this measure is rho\_A > 0.7, however values between 0.6 and 0.7 are considered to be acceptable (Hair et al., 2011; Hair et al., 2017). To check the convergent validity i.e., to



see in which degree one measure correlates positive with the other alternative measures of the specific construct (Hair et al., 2017) average variance extracted (AVE) is used. Where AVE with the recommended measure being  $AVE > 0.5$  (Hair et al., 2011; Hair et al., 2017; Henseler et al., 2016). Furthermore, the indicator reliability i.e., the outer loadings of each construct should be  $> 0.708$ , however, in research there has often times been used indicators below this, and instead of automatically eliminating all indicators that are below the recommended threshold, one should consider them for removal depending on if the removal gives an increased AVE and/or composite reliability (Hair et al., 2017). For the model in this study,  $\rho_A > 0.7$  with exception for one. However, since  $\rho_A > 0.6$  is acceptable, the values of the constructs are above the recommended measures. This also counts for AVE as the values are all higher than 0.5. Lastly, the outer loadings of each construct in the model are higher than 0.708, with exception for two: EXTBAR 4 and INTBAR3. Yet, since removing from the constructs did not lead to an increase in neither AVE nor composite reliability and it is  $> 0.4$ , it is to be kept in the conceptual model (Hair et al., 2017). In summary, internal consistency reliability and convergent validity are adequate in the structural model. Table 11-1 presents the measurements in the model.

*Table 11-1 Internal consistency reliability and convergent validity of the measurement model.*

Item	Outer loading	Cronbach's $\alpha$	Rho_A	Rho_C	AVE
EXTBAR1	0.746	0.788	0.819	0.863	0.613
EXTBAR2	0.811				
EXTBAR3	0.870				
EXTBAR4	0.692				
INTBAR1	0.707	0.816	1.128	0.854	0.596
INTBAR2	0.770				
INTBAR3	0.699				
INTBAR4	0.895				
IMBALANCE1	0.756	0.625	0.628	0.800	0.572
IMBALANCE2	0.796				
IMBALANCE3	0.714				
WASTE1	0.878	0.812	0.917	0.911	0.836
WASTE2	0.950				

#### *Discriminant validity*

The discriminant validity is the degree to which a specific construct is legitimately different from the other constructs according to empirical standards (Hair et al., 2017).

This means that checking the discriminant validity of the model is important, as it checks

that each single construct is empirically distinctive and is not represented by any of the other constructs in the model (Mwesiumo et al., 2021). To assess discriminant validity, both the Fornell-Larcker criterion and checking the cross loadings has often been used (Hair et al., 2017; Mwesiumo et al., 2021). Yet, Hair et al. (2017) argued that neither the Fornell-Larcker criterion or the cross loadings reliably identifies issues with the validity. As such the Heterotrait-Monotrait ratio of correlations (HTMT) developed by Henseler et al. (2015) has been proposed as a remedy (Hair et al., 2017). In short, a HTMT >0.90 indicates a lack of discriminant validity, although it is found that when the different constructs in the model are conceptually different HTMT >0.85 is justified (Hair et al., 2017). The HTMT for this conceptual model can be found in table 11-2 and shows that all HTMT values are less than 0.90 and 0.85. As such the HTMT in this model is adequate.

Table 11-2 Assessment of discriminant validity (HTMT).

	ECOP	ECOSUS	EXTBAR	IMBALANCE	INTBAR	SUMDIST	WASTE
<b>ECOP</b>							
<b>ECOSUS</b>	0.363						
<b>EXTBAR</b>	0.199	0.175					
<b>IMBALANCE</b>	0.525	0.431	0.794				
<b>INTBAR</b>	0.224	0.515	0.464	0.446			
<b>SUMDIST</b>	0.002	0.032	0.165	0.318	0.081		
<b>WASTE</b>	0.303	0.208	0.354	0.554	0.204	0.162	
<b>SUMDIST x IMBALANCE</b>	0.098	0.179	0.191	0.197	0.184	0.220	0.099

## 11.2 Hypotheses testing of structural model.

To start the hypothesis testing, I first created a bootstrapping sample so that I could gather standard errors for the hypothesis testing (Hair et al., 2011). Using a PLS-SEM analysis one must consider that it does not assume that the data is normally distributed. As a result, PLS uses a nonparametric bootstrapping in order to gather the standard errors (Hair et al., 2011). In this study I have run the model by using a 500 bootstrap because of the smaller sample size in this study, and the model was evaluated using the coefficient of determination ( $R^2$ ) and the adjusted coefficient of determination ( $R^2_{Adj}$ ).

## 12.0 Results and findings

This section of the paper presents the results and findings from the PLS SEM analysis, in addition to the semi-structured interviews.

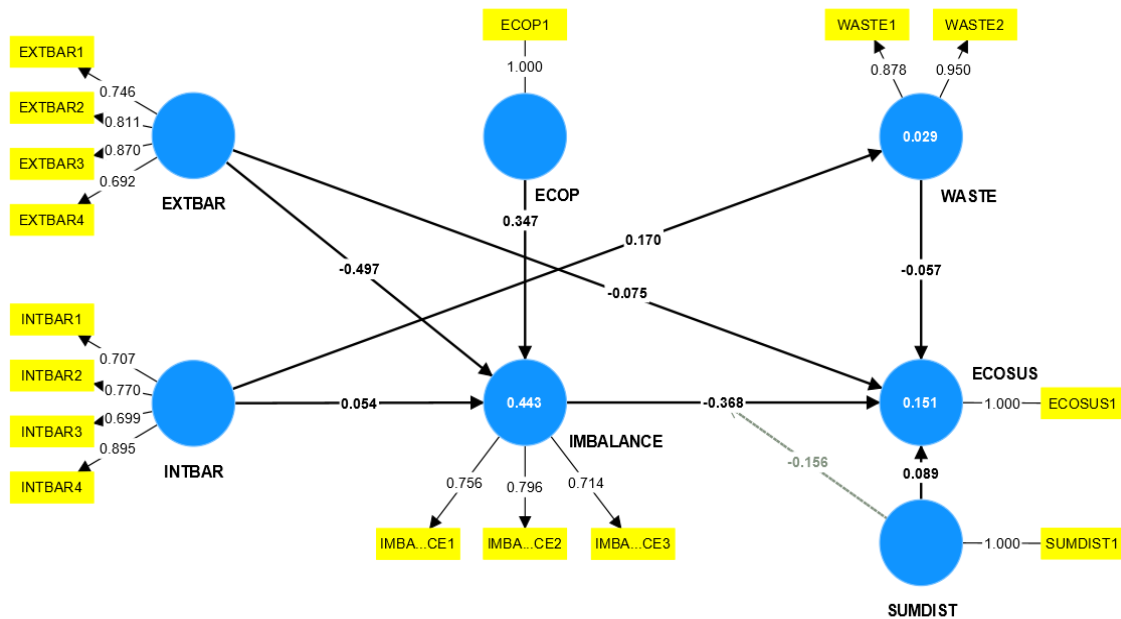


Figure 12-1 Structural model.

### 12.1.1 Results from estimating the structural model.

As shown in table 12-1, the path coefficient's absolute values range from -0.368 to 0.497. The coefficient of determination ( $R^2$ ) ranges from 0.029 to 0.443 and the adjusted  $R^2$  ranges from 0.011 to 0.412. As such, the highest  $R^2$  and  $R^2_{Adj.}$  is for the construct "IMBALANCE" with 0.443 and 0.412. In research values of 0.25, 0.50, and 0.75 are considered weak, moderate and substantial (Hair et al., 2017), meaning that the degree of variance explained through the model is appropriate. The hypothesis was tested by determining the significance of the path coefficients in the structural model (figure 12-1), which shows the causal connections between the focus variables.

The first hypothesis (H1) proposed that the number of economic operators (ECOP) used in the supply chain from production to end-consumer, is positively associated with producer's position to the imbalance of power in the sales channels (IMBALANCE). H1 is confirmed since the corresponding path coefficient is positive with 0.347 and it's significant at  $p < 0.05$ . The second hypothesis in this study (H2) proposed that the imbalance of power in the sales channels (IMBALANCE), negatively effects the producer's profit (ECOSUS). The corresponding path coefficient is negative on -0.368 and significant at  $p < 0.05$ . Meaning that H2 is confirmed.

The third hypothesis (H3) proposed that the number of distribution options used in the SC (SUMDIST) strengthens the effect of imbalance in the sales channels (IMBALANCE) to producers' economic sustainability (ECOSUS). The results show that there is a negative path coefficient (-0.156), but that there is no significant effect. Still, figure 12-2 shows the simple slope analysis of this moderating effect (SUMDIST), and it illustrates that the higher SUMDIST is, the stronger relation between IMBALANCE and ECOSUS ( $-0.156 + -0.368 = -0.524$ ), in turn this results in a negative effect on ECOSUS.

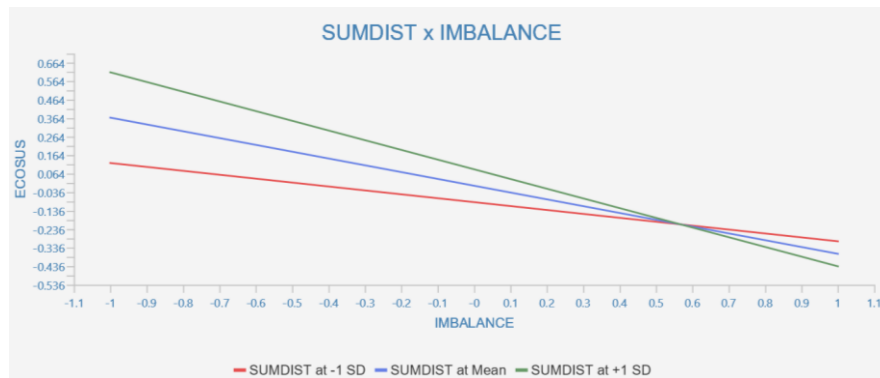


Figure 12-2 Interaction effect of number of distribution options and imbalance of power in the sales channels.

H4 proposed that the external barriers (EXTBAR) are negatively associated with producers' position to the imbalance of power in the sales channels (IMBALANCE). This Hypothesis is significant at  $p < 0.05$  and has a negative path coefficient of -0.497.

Hypothesis five (H5) proposed that producers' external barriers (EXTBAR) is negatively associated with their economic sustainability (ECOSUS). The results show that the path coefficient is negative with -0.075, but there is no significant effect.

The sixth hypothesis of the study (H6) proposed that the internal barriers that could be face by the producers (INTBAR), has a positive effect on producers' position to imbalance of power in the sales channels (IMBALANCE). It has a positive path coefficient of 0.054, but there is no significant effect. The seventh hypothesis (H7) proposed that the economic aspect of the waste from both raw materials and finished goods of production (WASTE) has a negative effect of producers' economic sustainability (ECOSUS). The result shows a negative path coefficient (-0.057), but there is no significant effect. The last hypothesis (H8) proposed that producers' internal barriers (INTBAR) effect the economic aspect of waste in their production in terms of both raw materials and finished produce (WASTE). The result show that the path coefficient is positive with 0.170 and that there is no significant effect.

As previously mentioned, the structural model includes mediating constructs. When mediating effects are included in the structural models, direct and indirect effects should be examined in order to assess the essence of mediation and/or non-mediation (Mwesiumo et al., 2021; Zhao et al., 2010). This study includes multiple mediators (SmartPLS, 2023a), as such the total indirect effects have been used here. According to the results, the total indirect effects of ECOP to ECOSUS is negative (-0.127) and significant at  $p < 0.1$ . EXTBAR to ECOSUS is positive (0.183) and significant at  $p < 0.05$ . INTBAR to ECOSUS is negative (-0.029) but there is no significant effect (see table 12-2). Based upon Zhao et al. (2010), ECOP to ECOSUS exhibits competitive mediation (i.e., partial mediation). EXTBAR to ECOSUS exhibits direct only mediation (i.e., no mediation). Lastly, INTBAR to ECOSUS exhibits no effect mediation (no direct or indirect effect).

Table 12-1 Result from the structural model analysis (n=57).

	<b>Path Coefficient</b>	<b>Sample mean</b>	<b>Standard deviation</b>	<b>T-statistics</b>	<b>P-values</b>
<b>ECOP-&gt;IMBALANCE</b>	0.347	0.341	0.108	3.211	0.001*
<b>EXTBAR-&gt;ECOSUS</b>	-0.075	-0.071	0.151	0.498	0.619
<b>EXTBAR-&gt;IMBALANCE</b>	-0.497	-0.494	0.097	5.122	0.000*
<b>IMBALANCE-&gt;ECOSUS</b>	-0.368	-0.370	0.142	2.583	0.010*
<b>INTBAR-&gt;IMBALANCE</b>	0.054	0.070	0.142	0.365	0.716
<b>INTBAR-&gt;WASTE</b>	0.170	0.203	0.149	1.145	0.253
<b>WASTE-&gt;ECOSUS</b>	-0.057	-0.070	0.143	0.398	0.691
<b>SUMDIST x IMBALANCE-&gt;ECOSUS</b>	-0.156	-0.157	0.125	1.254	0.211
	<b>R<sup>2</sup></b>	<b>ADJ. R<sup>2</sup></b>			
<b>ECOSUS</b>	0.151	0.068			
<b>IMBALANCE</b>	0.443	0.412			
<b>WASTE</b>	0.029	0.011			

Two tailed test (significance): \* significant at  $p \leq 0.05$

Table 12-2 Descriptive statistics for the total indirect effects (mediating constructs).

	<b>Path Coefficient</b>	<b>Sample mean</b>	<b>Standard deviation</b>	<b>T-statistics</b>	<b>P-Values</b>
<b>ECOP-&gt;ECOSUS</b>	-0.127	-0.129	0.069	1.854	0.064**
<b>EXTBAR-&gt;ECOSUS</b>	0.183	-0.181	0.077	2.368	0.018*
<b>INTBAR-&gt;ECOSUS</b>	-0.029	-0.032	0.069	0.426	0.670

Two tailed test (significance): \* significant at  $p \leq 0.05$ ; \*\* significant at  $p \leq 0.10$

## **12.2 Result from the interviews:**

This section of the study contains the results obtained from the four interviews with the focus being on the main subjects for this study. These findings are then connected to which hypotheses is confirmed or not confirmed through these interview results, and further seen up against the hypothesis in the discussion to elaborate them. The Interviews in this study have been analysed using thematical analysis method, following the steps in the framework by Castleberry and Nolen (2018, pp. 808-812); (1) transcribe, (2) code the transcripts, (3), reassemble the data using a matrices setup, (4) interpret data, and (5) conclusion. Due to the mixed method approach, the conclusion section of this study stems from both the quantitative and the qualitative data.

### **12.2.1 Production**

Regarding production, several of the interview objects found that the efficiency in production should never exceed the quality of the products. For instance, one of them stated that:

*“Local producer’s unit costs won’t be able to compete with the large industries. So, for them it is really about value optimization, as the production efficiency should not affect the quality of the products”.*

This means that the production for local food cannot be compared with the large industry, and that neither efficiency in production nor scaling up production should affect the quality of the product(s). Additionally, one of the participants mentioned that there is normally less waste of raw materials in the production compared to larger industry producers, which was explained through that many local producers are craftsmen first and foremost. Resulting in them finding other ways to use the raw materials that otherwise would be seen as waste.

Hypotheses 7 and 8 (H7 + H8) are proposing that waste in production generally will have a negative impact on producers’ economic sustainability, and that the internal barriers effect the waste in production. However, the interview object confirmed that they often just have a small amount of waste. Which means that the variable for H7 should have a weak but negative impact on the economic sustainability to be supported by the interviews. On the

other hand, H8 should have a positive impact on waste, though none of the hypotheses are statistically confirmed.

### **12.2.2 Transportation/Distribution/Wholesalers**

In terms of the section “transportation/distribution/wholesaler”, one participant found that since there are a lot of trucks on the roads, the decisive factor isn’t transport from A to B, but rather the sales and how to get the producers products of the shelves. While another participant found that everything about distribution depends on how the producers sell their products. Further it was found that one interview object divided the local food producers into small, medium, and large production companies:

*“I distinguish between those who are very small, and who are responsible for the distribution themselves (...) Then you have the large local food producers, who are large enough to be interesting for the large wholesalers to pick up goods at producers' location.*

For larger producers it is easier to get access to larger wholesalers. This means that the size of the producers has an impact to their access, supporting that there is an imbalance in the SC and thus the sales channels. This is supporting both hypothesis 2 and 4 (H2 + H4), where both are statistically confirmed. Further, the interview object continued:

*“(...) But there is a large group in between as well. They are too big to handle the distribution themselves, because then they have to have a large sales force, more cars, etc. But they are too small to be interesting enough for the big chains to join their distribution system”.*

This means that local food producers that can be seen as medium sized companies fall in between, resulting in a potential increase of costs for distributing their products. Thus, this is supporting both H1 and H3, although H3 is not statistically confirmed.

### **12.2.3 Imbalance of power (sales channels)**

Regarding the imbalance of power in the sales channels, the interview objects were found to agree about that it is not just the imbalance of power that is making it difficult for local food producers to be economical sustainable, but also how to manage to be picked out of the shelves by the consumers (e.g., marketing). Further, they were also in agreement that the imbalance of power indeed plays a vital role as a barrier for the producer’s economic

sustainability, although not for all producers but for several. One statement from the interviews to substantiate this is:

*“There are gatekeepers in many of the sales channels here. (...) Also, it is one thing to be allowed shelf access in stores, but then others in the industry say that getting the products off the shelves and to the consumer, is where the producers themselves must do the marketing and everything which builds around the sale of the product”.*

Further, the interview object continued describing the imbalance of power in the sales channels by stating that:

*“(...) the three chains not only control the food selection for own stores, but they also very much control what is sold to large households, because a lot is done through purchase agreements and the large household chains want to have as much input as possible from one channel. The system is somewhat based on "The winner takes it all" in many fronts”.*

Also here, H2 is supported. Where the hypothesis proposed that the imbalance of power in the sales channels negatively affect producer's economic sustainability.

#### **12.2.4 Barriers**

Throughout all four interviews there was identified several barriers that could hinder and/or complicate the path towards economic sustainability for the local food producers them self. In sum the four participants mentioned among others: Rules and regulations, additional and expensive intermediaries (i.e., economic operators) in the SC, too little production expertise, lack of suitable sales channels (i.e., marketplaces) for local food, so-called ‘helpers’ in the industry more about their self-interest, lack of suitable strategic choices and knowledge on how to sell the products, and production often being dependent on among others climate, animal health and more.

*“The medium-sized producers often end up having an extra link between them - another wholesaler. (...) But it often costs relatively much because the distributor they use doesn't get paid per kilo they transport, they get paid per percentage of what the products costs, and this means that local food often becomes unnecessarily expensive”.*



This shows that being a medium sized producer comes with difficulties, and could be among the most expensive, as the use of “extra links” increases producers cost in distribution. This was also stated by another interviewee with the statement:

*“(...) a distribution or wholesale distribution which often causes you to lose profits along the way”.*

Hypothesis 5 (H5) proposed that the external barriers are negatively associated with the producer’s economic sustainability. The objects in the interviews confirmed several external barriers here that could be challenging for producers regarding their economic sustainability. Still, the hypothesis was not statistically confirmed. On the other hand, hypothesis 6 (H6) proposed that the internal barriers have a positive effect on producers’ position about the imbalance of power in the sales channels. Yet, from the interviews there has not been found any support for this hypothesis, and H6 has also not been statistically confirmed.

### **13.0 Discussion**

This study seeks to examine economic sustainability for local food producers, and the impact of various variables. Economic sustainability has been seen in context with SFSC through several previous studies although also often gathered in the context of social, environmental and economic sustainability (see e.g., Campos et al., 2021; Doernberg et al., 2022; Jarzębowski et al., 2020; Malak-Rawlikowska et al., 2019; Mancini et al., 2019; Stein & Santini, 2022). In differ from previous researchers; this paper investigates economic sustainability and the impact of external and internal barriers, SFSC, imbalance of power, number of distribution options and waste, using a mixed method approach. The PLS-SEM model only supported three of the hypotheses, but the remaining five were partially “supported” from the path coefficient. This may be explained with the small number of respondents in the study. Further, the interviews gave more in-depth information and “supported” seven out of eight hypotheses, four of which were not statistically confirmed. This is discussed in the section below.

In the literature, it has been found that a reduced number of economic operators in SFSC could improve economic sustainability (Malak-Rawlikowska et al., 2019; Mancini et al., 2019). Other researchers have investigated imbalance in the sales channels (Richards

et al., 2013). In differ from these authors, this paper investigates if the number of economic operators in the SC, can be associated with the producers' position to imbalance in the sales channels. Which means; instead of looking at this separated, this article investigates the relationship between these factors in a more wholistic model.

The result in this study has shown a positive effect (path coefficient) between the constructs of number of economic operators and imbalance of power (H1). This means that when the number of economic operators increases, the stronger producer's position to the imbalance of power in the sales channels is. This finding could be explained further by data from the interviews, which revealed that mid-sized local food producers frequently require an "extra link" (i.e., economic operator) for distribution of their products towards the retail sector, among other things. Meaning that, in contrast to smaller producers who can arrange distribution themselves (e.g., selling through farmers market), mid-sized producers could be subjected to the private standards of retail chains mentioned by Richards et al. (2013). For instance, if they outsource, and thus increase the number of economic operators. Which again lowers their potential profits, that is influenced by the imbalance of power, as the umbrella chains own several of the wholesale companies as well (Milford et al., 2021). Further, it's not unreasonable to say that the medium sized producers would have the most difficulties with gaining shelf space in any of the retail chains according to the findings in the interviews. Additionally, producers selling through sales channels such as farmers markets or direct on farm, naturally have less or even zero intermediaries in their SC (Enthoven & Van den Broeck, 2021), especially if all activities in the value chain (e.g., marketing) is handled in-house.

The results from this study confirmed that the imbalance of power throughout the sales channels have a negative impact on the profitability of the producers, hence a negative impact on their economic sustainability (H2). This hypothesis was elaborated and supported in the interviews, where one participant among others stated that the system is somewhat based upon "the winner takes it all" in many aspects, where it would not be unreasonable to argue that the so-called "winners" in the statement of the participant are to be known as the large umbrella chains. Furthermore, through the interviews it was also found that the mid-sized producers often are "forced" to have an extra link i.e., distributor. Additionally, the mediating effect of producer's position to the imbalance in the sales channels, between the number of economic operators in the SC and economic sustainability, was statistically significant and showed a negative effect. Meaning that

when the number of economic operators increases, the stronger producer's position to the imbalance of power in the sales channels is, which negatively effects the economic sustainability.

Throughout the literature there has been found several categories of barriers for economic sustainability. However, also here, to my knowledge there has yet to be found studies linking the relationship of producers' external barriers to the imbalance of power in the sales channels. According to the results in this study, there is a negative effect (path coefficient) between their external barriers and the imbalance of power (H4), and the hypothesis showed a significant effect. This means that the external barriers negatively impact producers position about the imbalance of power in the sales channels. Balcom et al. (2023) found that one external barrier is the difficulties for market access, in addition there is found through researchers such as Richards et al. (2013) and Milford et al. (2021), increased difficulties for the producers to reach suitable sales channels. Where the two latter could be seen in tandem. This may be explained as, the higher external barriers result in producers having increased problems with expanding to larger sales channels. Since the external barriers included in this study are within the themes of lower prices for food chains own brands vs higher prices on local food, regulations, and high cost for marketing. It is not surprising that the external barriers negatively impact their positions to the imbalance in the sales channels. This could again be seen together with the literature about too few suitable sales channels for both this type of products and producers, and it has also been confirmed through the interviews held in this study, where one of the barriers found was a lack of suitable sales channels, since the industry is more or less adapted to the large industry.

Furthermore, the study also tested if the number of distribution options used in the SC, strengthens the effect of imbalance in the sales channels, to producers' economic sustainability (H3). Yet, the hypothesis was not confirmed, but the results did show a negative effect between the constructs, with the use of the construct "*Number of distribution options*" as a moderating effect. One assumption to explain why the hypothesis wasn't confirmed is that if a producer uses e.g., all three alternatives included (I.e., own distribution, large companies, and smaller companies), it could imply that the producer is of such size that they potentially are not inflicted with the imbalance of power. However, the slope analysis did reveal that a higher number of distribution alternatives

used, the stronger is the relationship between the imbalance of power and the profit for producers.

Moreover, this study also wanted to seek how the external barriers effect the economic sustainability (H5). Nave and Do Paço (2021) found that lack of support policies is a contributing external barrier. This has also been discovered through the interviews, where one participant discovered that there are many so-called 'helpers' in the industry for local producers, who are more concerned with their own interests and gains than with what is best for the producers. The hypothesis in this study revealed a weak negative effect (path coefficient) of -0.075, between the external barriers and the economic sustainability, but the hypothesis was non-significant. The weak effect could be a result of the smaller sample size (57) in this study. However, another explanation could be that not all producers aim at the large sales channels. From the interview it was found that local food producers should focus on the value optimization in their production. As such not all local food producer should increase production to suite larger sales channels, and thus the explanation could be that not all producers face the external barriers to the same extent, and as a result the external barriers included as indicators wont strong negatively impact their economic sustainability. Another aspect of this to argue for the result, is that a local food producer not necessarily needs to be large (i.e., sell to larger sales channels) to be economic sustainable, but that a small producer can be just as economic sustainable for their company size.

Further, Balcom et al. (2023) found that among others storing of products is related to the difficulties with market access. Two possible explanations for this might be that producer either need to expand production when selling to larger chain stores (like the umbrella chains), which implies the need for extra storage, or face challenges with storing in-house when selling through e.g., farmers markets. As such this study tested if the internal barriers correspond with the producer's positioning to the imbalance of power (H6). The results showed non-significant effect for the hypothesis. However, the results of the hypothesis did show a weak positive effect (path coefficient) between the two constructs (0.054). This could potentially be due to the smaller sample size in the study. Meaning that there is a weak, but positive effect, indicating that although the hypothesis is not confirmed, an increase of the internal barriers does somewhat lead to a stronger position about the imbalance of power. Another possible explanation for the weak effect could be that the producers them self don't feel strongly about the internal barriers

included as indicators for the construct in this study. The structural model could have included an additional hypothesis, testing how the internal barriers are associated to the economic sustainability. However, due to the number of respondents (57), and the total number of hypotheses in the study (8), the complexity of the structural model had to be limited. As such, in this study I prioritized to test the relationship between internal barriers and producers' position to the imbalance of power in the sales channel. Yet, the study did test the mediating effect, of producer's position to the imbalance of power in the sales channels, between internal barriers and economic sustainability. However, there was no significant effect.

Another aspect for discussion is the food waste in production, which is a well-known issue within the food sector (Nicastro & Carillo, 2021). This study found a weak but negative effect (path coefficient) of -0.057, between the waste and economic sustainability for the producers, but the hypothesis (H7) was not statistically confirmed. From the interviews it was found that local producers often have little waste of raw materials, which can explain the weak negative effect. However, although local food producers are found to commonly have less waste than larger industry producers, some waste is usually inevitable. Additionally, Bayir et al. (2022) did considered waste as an economic sustainability challenge for SFSCs. Yet, the weak negative effect, could also here be a result of the smaller sample size used in this study.

Lastly, this study found that there is a positive effect (path coefficient) between the internal barriers and waste in production (H8). However, the hypothesis was not statistically confirmed. This could be explained by the fact that internal barriers could prevent producers' company from growing, or selling more products; hence, the fewer products produced, the less waste of raw materials or finished goods at the production site. Additionally, also here the finding from the interviews, where producers often have little waste of raw materials can contribute to explaining this positive effect.

## **14.0 Conclusion**

The presented study aimed at examining local food producers' economic sustainability, and to seek how internal and external factors affects their profitability (and thus the economic sustainability). The paper used a more holistic model compared with previous research, where the factors often have been researched separately. E.g., imbalance in the sales channels (see e.g., Richards et al., 2013) or economic sustainability in SFSC (see e.g.,

Malak-Rawlikowska et al., 2019). To investigate the problem, I used a mixed method; PLS-SEM and interviews.

The analysis statistically confirmed that when the number of economic operators used in the total SC increases, producers' position to the imbalance of power in the sales channels also increases. In addition, it has been statistically confirmed that the producer's position of the imbalance in the sales channels, has a negative effect on their economic sustainability. Further, external barriers have a negative effect on both producers' economic sustainability, and their position to the imbalance of power in the sales channels. Yet only the latter was statistically confirmed. Moreover, although not statistically confirmed, there was also found positive effects from internal barriers to both producer's position to the imbalance of power in the sales channels and waste at production. In addition, the waste in production was found to have a weak but negative effect on the economic sustainability. However, this result was not statistically confirmed. Lastly, the study did not statistically confirm that the number of distribution options used by producers strengthens the effect of the imbalance in the sales channels to producers' economic sustainability.

#### **14.1 Limitation of the study and managerial implication**

In this study the research setting was Norway, and the main level of analysis were Norwegian local food producers. As a result, this study was limited to Norway. Further, the quantitative analysis consists of a relatively small sample size (57), although within the minimum limit by Wong (2013). This means that the structural model could have gained more accurate results if I had managed to obtain a larger sample size, and thus also could have run at least a 5.000 bootstrap sample, which is the recommended bootstrap by Hair et al. (2017).

#### **14.2 Suggestions for further research**

Suggestions for further research could be to test the relationship between local food producers' internal barriers and economic sustainability. In addition, it could be interesting for further research to see how the distribution could be improved for the medium-sized producers that fall between. Yet, without it going beyond the economic sustainability of the producers.

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## 16.0 Appendix A – Questionnaire in Nettskjema

### Masteroppgave HiMolde- Økonomisk bærekraft hos norske lokale matvareprodusenter.

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Side 1

Obligatoriske felter er merket med stjerne \*

Heil

Denne spørreundersøkelsen er en del av min avsluttende masteroppgave ved Høgskolen i Molde, våren 2023. Svarene som hentes inn, skal brukes ifm å se på økonomisk bærekraft, barrierer og potensielle forbedringer for lokale norske matvareprodusenter. Spørreundersøkelsen tar omtrent 15 minutter.

Denne spørreundersøkelsen er anonym, og det må ikke oppgis informasjon som enten direkte eller indirekte kan identifisere deg. Der- som det skulle være noen spørsmål som gjelder spørreundersøkelsen kan det tas kontakt med Natasha van der Linden på mail: [Natasha.van.der.Linden@himolde.no](mailto:Natasha.van.der.Linden@himolde.no)

#### Generell informasjon.

Hvilken type kategori tilhører deres produkt(er) til? \*

Grønnsaker

Frukt

Sjømat

Ost

Kjøtt

Egg

Honning

Bakevarer

Drikkevarer

Annet

Hvor mange fulltidsansatte er det hos dere? \*

Velg ...



Hvor mange deltidsansatte er det hos dere? \*

I hvilket fylke i Norge er bedriften lokalisert? \*

Agder

Innlandet

Møre og Romsdal

Nordland

Oslo

Rogaland

Vestfold og Telemark

Troms og Finnmark

Trøndelag

Vestlandet

Viken

I hvilken fylker blir produktene deres solgt? \*

Agder

Innlandet

Møre og Romsdal

Nordland

Oslo

Rogaland

Vestfold og Telemark

Troms og Finnmark

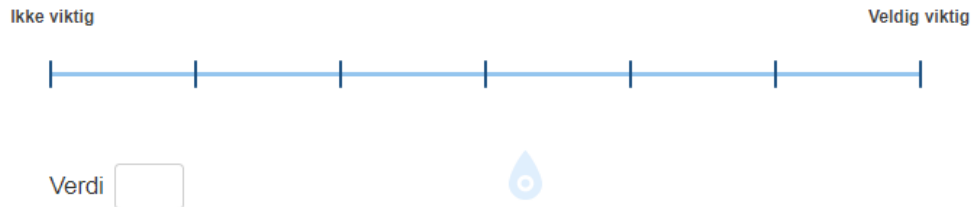
Trøndelag

Vestlandet

Viken

## Produksjonen

I hvor stor grad er forholdet til leverandøren av deres emballasje viktig for dere? \*



Hva er det viktigste for dere ved emballasjen. \*

- Pris
- Kvaliteten
- Etikettene
- Utforming
- Annet (Skriv under)

Hvor uenig eller enig er dere i følgende utsagn:

	Sterkt uenig	Uenig	litt uenig	Nøytral	Litt enig	Enig	Sterkt enig
Vår interne logistikk (forflytting av varer på produksjonsområde) har forbedringspotensial. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dersom en til to ansatte blir sykmeldt/blir forhindret fra å komme på jobb, så er vi fortsatt nok ansatte til å få varene ut uten å bryte kontrakter. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vi har lite svinn av råvarer. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vi har lite svinn av ferdigproduserte produkter fra lager. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vi har en produksjonskalkyle til våre produkter som er oppdatert til dags dato. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vi har et driftsbudsjett som følges. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vi har et salgsbudsjett som holdes oppdatert til dags dato. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vi mener at det er en god flyt i produksjonen av våre produkter. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Våre etiketter på emballasjen inkluderer informasjon om opprinnelse til produktet. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Anser dere det som at dere har en økonomisk bærekraftig produksjon i dag? \*

Ja

Nei

Vet ikke

### Transport/distribusjon/grossist

Hvordan blir produktene deres distribuert? \*

Gjennom store grossistvirksomheter (F.eks REMA Distribusjon, ASKO, eller Coop Norge)

Styrer egen distribusjon

Gjennom mindre grossistvirksomheter (skriv hvilken under)

Pris ordningen for transport av varene er: \*

Verdibasert

Kostbasert

Annet (beskriv under)

Hvor stor fortjeneste har dere? \*

0-10%

10-15%

15-20%

20-25%

25-30%

Over 30%

Hvor stor del av deres kostnader går til bruk av grossisttjenester? \*

Oppgitt i prosent.

- 0%
- 1-10%
- 10-15%
- 15-20%
- 20-25%
- 25-30%
- Over 30%

Hvor uenig eller enige er dere i følgende utsagn:

	Sterkt ueng	Uenig	Litt uenig	Nøytral	Litt enig	Enig	Sterkt enig
Vi må benytte oss av en kjølekjede for produktene/produktet vårt (f.eks frysevarer/kjølevarer). *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vi benytter oss av muligheten til å lagerføre produktene hos vår grossist. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vi har en sentral beliggenhet i forhold til distribusjon av produktene. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vi er involvert i returordninger for varer utgått på dato. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hvor mange aktører/mellomledd er det i deres forsyningskjede (fra produsent og helt til forbruker)? \*



## Salgskanaler

Hvilken type salgskanal brukes av bedriften for å selge produktet/produktene til forbrukeren(sluttbruker)? \*

Huk av for de alternativene som benyttes av bedriften.

- Gårdsutsalg
- Gårdsutsalg gjennom REKO
- Lokal butikk
- Gårdsutsalg m/egen nettbutikk
- Salgsvogn/messesalg
- Lokal Kafe´
- Dagligvarekjede(ne) (REMA1000, MENY, Coop, KIWI etc.)
- Bondens marked
- Spesialbutikker
- Lokalt hotell
- Horeca

Hvilken av salgskanalene er viktigst for dere for å sikre økonomisk bærekraft? \*

Huk av for de 2 viktigste.

- Gårdsutsalg
- Gårdsutsalg gjennom REKO
- Lokal butikk
- Gårdsutsalg m/egen nettbutikk
- Salgsvogn/messesalg
- Lokal Kafe´
- Dagligvarekjede(ne) (REMA1000, MENY, Coop, KIWI etc.)
- Bondens marked
- Spesialbutikker
- Lokalt hotell
- Horeca

Hvor uenig eller enige er dere i følgende utsagn:

	Sterkt uenig	Uenig	Litt uenig	Nøytral	Litt enig	Enig	Sterkt enig
Vi ønsker å bli større ved å få produktene ut til de store dagligvarekjedene. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vi trives ikke der bedriften er idag. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Det er vanskelig å få plass på de ut-salgsstedene vi ønsker. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Det er en skjev maktfordeling i bran-sjens salgskanaler. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vi ønsker å kun selge produktene våre regionalt. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Barrierer

Hvor uenig eller enig er dere i følgende utsagn:

	Sterkt uenig	Uenig	Litt uenig	Nøytral	Litt enig	Enig	Sterkt enig
Frakten av våre produkter er utford-rende fordi vi må benytte oss av ek-sisterende distribusjonsnett som er både styrt og eid av de store para-ly kjedene. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vi konkurrerer på "grønne" mat-vareprodukter som får en høyre pris enn andre produkter, dette resulter-er i at vi ikke får solgt varene våre i dagligvarehandelen. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Matvarekjedene og deres egne merkevarer har en lavere pris som gjør det vanskelig å konkurrere med. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avtaleverket i dagligvarekjedene gjør det vanskelig for oss å få en hylleplassering som vi blir fornøyd med. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Det er vanskelig for oss å nå frem med markedsføring av lokale varer fordi det koster for mye. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hvor uenig eller enig er dere i følgende utsagn:

	Sterkt uenig	Uenig	Litt uenig	Nøytral	Litt enig	Enig	Sterkt enig
Utfordringen ligger i å kunne produsere i stor skala, fordi vi ikke har produksjonskapasiteten i form av utstyr og/eller fysisk plass. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vi har ikke lagringsplass internt til å kunne lagre produktene i påvente av frakt *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vi har ikke nok ressurser (personell) til å kunne produsere i stor skala slik dagligvarehandelen ønsker. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vår kunnskap om forsyningskjeden er for lav til at vi som produsent kan styre distribusjonen selv. *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Er det andre årsaker som gjør at det er vanskelig å få en økonomisk bærekraftig produksjon?

### Fremtidig

Hva er de fem viktigste faktorene for at deres bedrift skal kunne oppnå/opprettholde en økonomisk bærekraftig produksjon i fremtiden? (Ranger fra 1-5 der 1.plass er viktigst). \*

## 17.0 Appendix B – Semi-structured interview guide

Våren 2023

### Intervju guide – Masteroppgave HiMolde.

#### **Innledning:**

1. Hvordan vil du beskrive dagens marked for lokalmat?

#### **Produksjon:**

2. Hvilke produksjonsmessige faktorer mener du er viktig for at norske lokale matvareprodusenter skal kunne være økonomisk bærekraftige?

#### **Distribusjon/Transport/Grossist:**

3. Hvilken rolle vil du si at distribusjonen har for å oppnå økonomisk bærekraft hos lokale matvareprodusenter?
4. Hvilken rolle vil du si at transport har for å oppnå økonomisk bærekraft hos lokale matvareprodusenter?
5. Hvilken rolle vil du si at grossist tjenester har for å oppnå økonomisk bærekraft hos lokale matvareprodusenter?

#### **Salgskanaler:**

6. Hvilken rolle mener du salgskanaler har for lokale matvareprodusenter?
7. Er salgskanaler en avgjørende faktor for produsentenes økonomiske bærekraft?
8. Hvordan vil du beskrive maktfordelingen i bransjens salgskanaler (eksempelvis mellom de ulike aktørene i forsyningskjeden?).

#### **Barrierer:**

9. Hva vil du si at er de største utfordringen for de lokale matvareprodusentene?
10. Hvilke utfordringer er det for lokale matvareprodusenter å selge i dagligvarebutikkene?
11. Er det utfordrende for små produsenter at eksisterende distribusjonsnett ofte er styrt av de store paraplykjedene?
12. Kan det være utfordrende for produsentene at dagligvarebutikkene selger egne merkevarer?

#### **Fremtidig:**

13. Hva mener du at burde forbedres for produsentene av lokalmat i økonomisk bærekraft i fremtiden?

## 18.0 Appendix C – PLS-SEM results

Table 18-1 Setting - Bootstrapping in SmartPLS4.

	Setting
Complexity	Complete (slower)
Confidence interval method	Percentile bootstrap
Parallel processing	Yes
Samples	500
Seed	Fixed seed
Significance level	0.05
Test type	Two tailed