

Key aspects of scaling-up short food supply chains: A survey on Swedish food producers

Ausweitung kurzer Lieferketten im Lebensmittelbereich: Eine Umfrage unter schwedischen Lebensmittelproduzenten

Eva FLEIß and Vivianne AGGESTAM

Summary

Food producers across Europe have explored alternative ways of marketing their products. However, a key challenge for new food businesses in Sweden is the need to scale-up to survive on the market. When dealing with this decision, farmers face potential consequences that can either hinder or foster their intentions to scale-up. This study aims to elicit if such consequences (e.g. the necessity to invest, to cooperate more with the conventional supply chain) and socio-economic characteristics influence farmers' intentions to scale-up. Results of an online survey of a sample of Swedish short food supply chain producers are presented. In addition to several socio-economic aspects, a higher intention of Swedish producers to scale-up corresponded with the perception that this option reduces the potential of their business to fail, to increase diversification and to invest more in machines.

Keywords: short food supply chains; scaling-up; sustainable business models

Zusammenfassung

LebensmittelerzeugerInnen in Europa haben alternative Wege erprobt, um ihre Produkte zu vermarkten. Eine große Herausforderung in Schweden besteht in der Frage, ob bzw. wie diese neuen Unternehmen im Lebensmittelbereich zu vergrößern sind, um am Markt zu bestehen. Bei dieser Entscheidung stehen LandwirtInnen möglichen Konsequenzen gegenüber, welche die Intention, das Unternehmen zu vergrößern, begünstigen oder hindern können. Die vorliegende Studie

untersucht, ob derartige Konsequenzen (z.B. die Notwendigkeit zusätzlicher Investitionen, oder mit der konventionellen Lieferkette zu kooperieren etc.) sowie sozio-ökonomische Charakteristika die Intention der LandwirtInnen, das Unternehmen zu vergrößern, beeinflussen. Präsentiert werden Ergebnisse einer online-Umfrage eines Samples schwedischer LebensmittelproduzentInnen. Es zeigt sich ein Einfluss sozio-ökonomischer Charakteristika. Weiters korrespondiert eine höhere Intention zur Unternehmensvergrößerung mit der Einschätzung, dass dadurch das Risiko des Scheiterns reduziert wird, sowie Investitionen in Maschinen bzw. eine stärkere Diversifizierung notwendig sind.

Keywords: kurze Lieferketten; Ausweitung/Vergrößerung; nachhaltige Geschäftsmodelle

1. Introduction

Over the last decades, food production systems have been industrialised on a global scale and reshaped how food is produced, accessed and consumed. Focussing on economic efficiency, food producers have systematically struggled with lower financial returns whilst at the same time applying heavy pressure on ecosystems to meet the demand for low-priced food (PRETTY, 2001). These challenges have also been experienced by Swedish producers and have forced many to generate new business models involving new ways of collaborating with the environment (sustainable methods, organic production), other food producers and consumers. In short food supply chains (SFSCs) the number of intermediates in a supply chain is minimised, preferably to a direct relationship between the producer and a consumer (KNEAFSEY et al., 2013; MARSDEN, 2000; RENTING et al., 2003). The consumer interest in SFSCs stems from the consumer demand for production transparency (i.e. product quality and environmental standards) mainly due to health scares of industrial production and product traceability given by its direct relations to consumers. Also, through this way of purchasing food products, consumers are given the power to decide what and from whom to buy products (i.e. the power of individual decisions). SFSC businesses are usually associated with better quality and sustainable production practices; however, there is no guarantee that such attributes exist (WINTER, 2003). Despite this, governmental efforts to promote SFSC

businesses have been seen in Europe and the US (FAO, 2014). As such, maintaining these qualities in SFSC businesses is one of the main challenges when scaling up (BORN and PURCELL, 2007; HINRICHS and BARHAM, 2007; HINRICHS, 2003). The term 'scale-up' is defined as action(s) stimulating performance and efficiencies resulting in economic growth of one's business (MOUNT, 2012). It refers to processes and decisions food producers implement to reach a wider number of people. Scaling-up therefore can apply to all or some levels of a supply chain. Challenges include maintaining the original concept of SFSC businesses, and practical problems such as low-cost transport logistics, lack of adequate selling points or regional facilities. Furthermore, increasing workload and machine-use (BORGES et al., 2014), the need to increase diversification within their business (i.e. offering an on-farm shop, innovative methods of crops, production, processing and packaging) are also potential risks of scaling-up (PARMENTIER, 2014).

The aim of this study is to explore the intentions of Swedish SFSC producers to scale-up their businesses, paying special attention to fostering or hindering aspects in this regard: socio-economic characteristics of SFSC producers and their personal evaluation of potential consequences of scaling-up. In Section 2, context information about local food producers is presented. Empirical methods applied are described in Section 3, results are presented in Section 4, and Section 5 includes discussion and conclusions.

2. Swedish regional food producers

Swedish SFSC producers uphold a strong emphasis on *how* and *where* products are produced. This corresponds to Swedish consumer demand for increased trust in producers and food products to be healthy for consumption and high environmental standards. According to the SWEDISH BOARD OF AGRICULTURE (2014) the number of small-scale and SFSCs has increased in Sweden in the last three years. Thus, the Swedish government has a political and economic interest in the rural development and as such, focusses on green growth and scaling-up businesses such as SFSC businesses, utilising new technology, digitalisation, and new working methods all of which need to contribute to social, economic and environmental benefits (EUROPEAN COMMISSION, 2014). However, such governmental goals generate a paradox, as they

require harmonising activities to scale-up, while maintaining the qualities consumers seek. Having said that, despite governmental efforts to stream-line and increase opportunities for all types of producers to innovate their business model, Swedish SFSC producers are still experiencing various obstacles, i.e. reaching the consumer in an efficient way, transportation, complicated policies, or lack of unique traits for some farms and fear of failure (BJÖRKLUND et al., 2008). Obstacles such as these could be considered by producers who are developing a business plan that includes scaling-up.

3. Data and method

An online survey was conducted amongst different types of SFSC producers in Sweden between October and December 2015 (see section 4.1 for a description of SFSC producers in our sample). The questionnaire was developed considering results of previous studies and semi-structured qualitative telephone interviews that were carried out beforehand with six SFSC producers in Sweden. Individuals responsible for main business decisions in Swedish SFSCs are the population of interest. Email addresses of respective SFSC producers were provided via a database operated by Eldrimner (<http://www.mathantverk.se/kartboken/>). Eldrimner is an organisation that provides information and contact details of over 1300 SFSC producers in Sweden. All contacts listed with valid email addresses resulted in a total sample of $n=1109$ SFSCs and were sent an online questionnaire and three reminder emails. The total response rate amounted to 30.7% ($n=341$). Neither the contact list, nor the obtained sample can be assumed to be representative for Sweden (see AGGESTAM and FLEIß, 2017, for more details). The questionnaire addressed the following topics: SFSC producers' intention to scale-up their businesses, consequences they believe scaling-up might entail, and socio-economic characteristics.

Intention, which is commonly perceived as a good indicator for individual action (see e.g. AJZEN, 1991; AJZEN, 2006), was measured with four statements on a five-point scale (see Tab. 1). Socio-economic characteristics aim to gather detailed information about SFSC producers' farms, e.g. farm size, type of production, number of employees, etc. and their business models, e.g. if they have direct contact with their

consumers, depend on the availability of logistics and structural infrastructure outside the mainstream food supply chain (i.e. regional infrastructure such as transportation vehicles, process and storage facilities) etc. Items to capture possible consequences of scaling-up were developed based on the results of the six qualitative interviews in Sweden; these questions primarily related to the business model functionalities and include positive and negative consequences of their opportunities to scale-up (see Tab. 2). Statistical analysis was carried out using STATA 12. Descriptive statistics was used to evaluate response frequencies of socio-economic characteristics. Depending on the measurement level, either the U-test or Spearman correlation were applied to investigate the relationship between potential consequences of scaling-up as well as socio-economic characteristics and the SFSC producers' intentions to scale-up.

4. Results

For the following results, the number of observations for the respective analysis may be smaller than the total sample size because several questions were not mandatory. Also, the number of interviewed SFSC producers included a wide range of diverse business approaches and products but defined themselves as SFSCs. The results are not differentiated by the specific types of SFSCs.

4.1 Socio-economic characteristics

57% of the respondents (n=142) employ organic, and 43% (n=106) conventional production systems. 76% (n=174) state to depend a little/not at all on regional infrastructure, whereas 24% (n=56) depend fully/heavily on it. On average, SFSC producers state that their farm size is about 51 hectares (n=243, SD=143.4). The number of full-time employees is rather low with on average 1.6 employees (n=242, SD=3.1). 45% state to have no full-time employees, 45% to have between one and three full-time employees. This appears similar for part-time employees (n=240; mean=2.9, SD=11.1): 43% state not to employ people part-time; 40% state to have between one and three part-time employees.

Respondents have on average been working in a SFSC for 12.5 years (n=231, SD=12.0), whereby about 50% report to having done so for nine years or less. 84% (n=204) report that their business is a family business

that also provides for 70% (n=168) the main source of their income. In addition, 77% (n=187) state to have direct contact with all or the majority of their consumers and 82% (n=201) state to sell all or the majority of their products through a SFSC.

4.2 Explorative factor analysis on intention to scale-up

An explorative factor analysis was conducted for items measuring SFSC producers' intentions to scale-up their business. Extracting factors with Eigenvalues greater than 1 suggested a one-factor solution. Factor loadings for all items were greater than 0.45, without any cross-loadings. The mean-scale was computed accordingly (Cronbach's Alpha =0.89; n=226; mean= 3.9 ± 0.93). Therefore, we consider those items as adequate measurement of SFSC producers' intention to scale-up their business (see Table 1 for details). Most respondents show a high intention to scale-up (mean=3.9; scale from 1 to 5; higher numbers indicate stronger intention).

Tab. 1: Explorative factor analysis for intention

Items measuring intention	Factor loadings
I personally would want to scale-up my business.	0.51
I am considering scaling-up my business in the coming years.	0.50
I plan to scale-up my business in the coming years.	0.53
I would never scale-up my business.	0.45

Factor sampling: principal component analysis; rotation: oblique; reported are factor loadings of items.

Source: OWN CALCULATIONS

Subsequently, it is investigated with bivariate analyses if the socio-economic characteristics (see Section 4.1) can be considered as key aspects for SFSC producers' intentions to scale-up their business.

4.3 Key aspects to scaling-up

We observe significant Spearman correlations between the intention to scale-up and the number of full-time ($r=0.24$, $p<0.05$) and part-time employees ($r=0.21$, $p<0.05$) and the number of years having worked in a SFSC ($r=-0.22$, $p<0.05$). A higher number of employees corresponds with a stronger intention to scale-up, whereas SFSC producers who have

worked in a SFSC for a long time have less intention to scale-up. Results of U-tests indicate that SFSC producers who depend not at all/a little on infrastructure have a higher intention to scale-up (mean ranks for little/no dependence: 132.8, 107.3 for heavy/full dependence; $p < 0.05$), as do farmers who state that their business provides the main source of their income (mean ranks for main source of income: 121.2, for those who state that it does not provide the main source of income: 95.6; $p < 0.05$). Several significant correlations regarding the relationship between intention and possible consequences of scaling-up are observed (see Tab. 2). A higher intention of SFSC producers to scale-up their business corresponds with the perception that this option reduces the potential to fail their business, to invest more in machines and to increase diversification; it does not correspond with increasing workload.

Tab. 2: Spearman correlation between consequences and intention

Consequences: Scaling-up my business ...	Intention
reduces the potential to fail my business.	0.26**
allows to still have personal interactions with consumers.	0.07
means to cooperate more with the conventional supply chain.	0.10
increases my workload.	-0.17*
means that I have to buy more land.	-0.06
means that I have to rely more on my region's infrastructure.	-0.07
means that I must invest more in machines.	0.19**
means that I have to increase my diversification.	0.30**

Consequences-statements were measured on a five-point scale (1=strongly disagree, 5=strongly agree); Intention refers to the mean-scale; higher values indicate higher intention to scale-up; ** $p < 0.05$, * $p < 0.1$.

Source: OWN CALCULATIONS

5. Discussion and Conclusions

Several socio-economic characteristics appear important for SFSC producers' intentions to scale-up their businesses, part of which can be perceived as fostering prerequisites for this strategy (e.g. high number of employees, none or minor dependence on regional infrastructure). This corresponds to some extent with previous studies that suggest that Swiss farmers' growth intention is influenced by farm characteristics, e.g. farm size and diversification (HUBER et al., 2015). ELLIS (2006) also addressed if farmers' socio-economic conditions in the US influenced

adoption rates of new cropland, and found farm size, age, education and community collectives to be critical for farmers' decision-making process. Interestingly, low dependence on regional infrastructure corresponds with high intentions to scale-up, which could indicate stronger collaborations amongst producers, and as such, generating tailor-made solutions for themselves and their region. Due to the collaborative spirit between producers, they do not only share knowledge, but also access of tools, technology and storage facilities and as such, would not require an increased use of public or private infrastructure. It could also indicate that Swedish SFSC producers have limited or no desire to expand outside their regional borders (which would require a significantly higher use of built infrastructure). No significant results are observed for several potential consequences of scaling-up, i.e. the relationship between the SFSC producers' intentions and personal interactions with consumers, collaboration with the conventional food supply chain, the necessity to rely more on the region's infrastructure or the pressure to purchase or rent more land for production. It is somewhat contradictory to the previous report by BJÖRKLUND et al. (2008) who suggested these aspects to be significant factors for producers' adoption of a short supply chain business model. It is important to note that since the report was published in 2008, the increase in public demand and governmental pressure to support and further stimulate innovative business models were not as developed as today. Workload does not appear to have a great impact on intentions to scale-up. It is an interesting aspect as SFSC could signify a higher concentration of work or time spent, in particular aspects of selling and of reaching consumers added to the role of producers (LANGHADE, 2010). However, if collaboration and networking is part of a SFSC, workload does not necessarily increase but adapts to working on various tasks along a supply chain. For example, SFSC producers allocate tasks on-farm and off-farm. However, our results indicate that Swedish SFSC producers who intend to scale-up believe that scaling-up could reduce the potential for their business to fail. Investment in new or more machines together with diversification of products and services also corresponded with SFSCs producers' intentions to scale-up. Scale of production is commonly associated with financial success and survival of one's business. Therefore, land expansion (if possible), an increased number of agricultural machines, and diversification to minimise risks

of failure are a few examples of measures taken in the process of scaling-up. Overall, utilising a behavioural rather than a more common policy approach, we find a decision-making process that considers financial incentives. In this case, financial incentives given for scaling-up by public policies seem to be a strong factor influencing SFSC producers' intentions. The perceived negative consequences do not seem to hinder the intention to scale-up. Finally, the socio-economic conditions a farm has plays a stronger role in the intention to scale-up.

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Anschrift der Verfasserinnen

Eva Fleiß, MA and Mag. Vivianne Aggestam
Institute of Systems Sciences, Innovation and Sustainability Research, University of Graz
Merangasse 18/1, 8010 Graz, Austria
Tel. Aggestam: +43 (0) 699 11319179
eMail: eva.fleiss@uni-graz.at; vivianne@aggestam.com