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Short food supply chains: The link between participation and farmers' competencies

Chrysanthi Charatsari¹, Fotis Kitsios², Evangelos D. Lioutas³

¹School of Agriculture, Aristotle University of Thessaloniki, Greece, chcharat@agro.auth.gr

²Department of Applied Informatics, School of Information Sciences, University of Macedonia, Greece, kitsios@uom.gr

³Department of Supply Chain Management, Technological Educational Institute of Central Macedonia, Greece, evangelos@agro.auth.gr

Abstract

Research on short food supply chains (SFSCs) has experienced remarkable growth during the last years, offering ample evidence that the creation of such alternative food distribution networks can bring multiple benefits for both farmers and consumers. Nevertheless, farmers' engagement in SFSCs is still below the expectations. Two studies designed to illuminate the role of competencies in the development of SFSCs are reported in this paper. The first one assessed the influence of farmers' self-perceived competencies on their willingness to participate in SFSCs. The second examined whether the engagement in SFSCs affects the levels of participants' competency needs. Study 1 revealed that willingness to participate in SFSCs is affected by the levels of farmers' competencies on issues pertaining to management, entrepreneurship, marketing, networking, and cooperation. Although other factors such as producers' citizenship behavior, their environmental concern, and the perception that engagement in SFSCs can increase farm income are also associated with this willingness, self-perceived competencies represent the most important set of predictors. Study 2 uncovered that participation in SFSCs increases farmers' needs in all the above mentioned categories of competencies. Taken together, these results indicate the decisive role of farmers' competencies for both their involvement and success in SFSCs, and highlight the need to create spaces that help producers develop and exploit new capabilities.

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Keywords: short food supply chains, competencies, willingness to participate, competence development, food networks

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Introduction

The contemporary concern over sustainable supply chain management (Wichaisri and Sopadang, 2018), along with the consumers' (Bonnedahl and Caramujo, 2018) and other stakeholders' intent to support alternative food distribution initiatives (Aubry and Kebir, 2013), have led to a rising interest over short food supply chains (SFSCs). In an SFSC, producers sell their products to consumers without the intervention of intermediaries, or with the intervention of only an extra node between the producer and the consumer (Chiffolleau, 2008). This organization of SFSCs allows consumers to have information on the products they buy, whereas it also permits farmers to know their customers' needs and wants (Renting et al, 2003). Such food distribution channels are an alternative to conventional, commercially oriented conduits, which might negatively affect the sustainability of food systems (Swisher et al, 2018). Research findings confirm that SFSCs have the potential to reduce the environmental impacts of conventional food supply schemes (Galli and Brunori, 2013), to enhance social sustainability (Schmutz et al, 2017), to ensure a fair income to producers (Blumberg, 2018), to better serve consumers' needs (Ortmann and King, 2010), and to open-up new spaces for a more active participation of women in agricultural production (Zirham and Palomba, 2016).

The growing interest on alternative food production and distribution networks has led to an analogous increase of research interest on these supply schemes during the last years (Luo et al, 2018). Nevertheless, the distribution of research interest among various topics within SFSCs literature is quite uneven. Work on consumers' behavior towards these chains shows a consistent focus on the motives driving participation in such production-consumption lines (Hashem et al, 2018; Giampietri et al, 2016). On the other hand, the antecedents of farmers' participation in SFSCs have received only a small share of attention. However, to further support the development of alternative food networks, an important riddle to be solved is: how to increase farmers' participation in such initiatives (Bruce and Som Castellano, 2017).

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Among the limited number of studies investigating the drivers of producers' participation in SFSCs, Demartini et al (2017) uncovered that the main motive for Italian farmers is the development of a smoother linkage with consumers, which permits producers to better communicate the value of their products and to build trust-based relationships with buyers. In a study in Hungary, Benedek et al (2018) found that participation is associated with farmers' plans to invest in their farm enterprises in the near future. Other works emphasize the role of competencies in willingness to participate. For example, Moroney et al (2013) suggest that farmers' participation in SFSCs is the output of external incentives and internal resources, which include farmers' knowledge, skills and competencies. Sellitto et al (2018) note that producers often face difficulties in adapting to the new needs created through the participation in a SFSC, supporting Carbone's (2018) argument that the new tasks associated with participation in a SFSC increase the need for supplying farmers with new competencies. Consistent with these contentions, a recent study revealed that farmers' competencies in communicating and cooperating are significant predictors of their willingness to engage in SFSCs (Charatsari et al, 2018a). Under this prism, the role of competencies in the development of SFSCs deserves more research attention.

According to Mulder (2014), the term competence refers to a person's capacity to effectively perform different tasks related to her/his job or role in specific situations. Personal skills and specific knowledge put the basis for professional competence (Epstein and Hundert, 2002). Nevertheless, this capacity encompasses not only knowledge and professional abilities, but also different intellectual and cognitive skills, motivational inclinations, personal values and patterns of social behavior, which altogether help the individual to successfully carry out the demands of a job (Weinert, 2001). Importantly, studies from different work settings have showed that levels of competence are associated with professional's self-efficacy (Charatsari et al, 2018b; Lauer mann and König, 2016; Tyler et al, 2012), that is the set of perceptions a person holds about her/him abilities to perform specific tasks (Bandura, 1982). People who evaluate their competencies as sufficient tend to express higher work engagement (Consiglio et al, 2016) and performance (Stajkovic and Luthans, 1998). On the other hand, when individuals have negative perceptions on their competencies – and, consequently, low

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self-efficacy – tend to avoid the involvement with tasks that they feel they cannot accomplish (Meijman and Mulder, 1998). In this vein, farmers' competencies can enhance or undermine both their motivation to participate in SFSCs and their ability to cope with the demands of an alternative food network.

In this work, we aimed at empirically examine this conjecture. To do so, we conducted two quantitative studies based on data collected from different samples of Greek farmers. In Study 1 we tested if levels of farmers' competencies predict their willingness to participate in SFSCs, whereas in Study 2 we explored whether participation in SFSCs increase competency needs.

The present studies

Work in the field of alternative food networks indicate that cooperation competencies (Chiffolleau, 2009), networking skills (Brunori et al, 2012), managerial abilities (Bauman et al, 2017), and market knowledge (Sage, 2003) are crucial factors for the success of unconventional food distribution schemes. Moreover, recent work stress the importance of various types of entrepreneurial (Pindado et al, 2018), social (Lans et al, 2016) and managerial competencies (Bryła, 2018) for farmers in order to survive in the current economic environment. In the first study, informed by the relevant literature, we developed an instrument encompassing the abovementioned sets of competencies. Then, we investigated the effects of the emerged through the analysis sets of competencies on farmers' willingness to participate in SFSCs.

Nevertheless, recent evidence suggests that this willingness is also affected by farmers' citizenship behavior (Charatsari et al, 2018a) – i.e. the discretionally (and not directly linked with the intent of gaining rewards) behavior of an individual which contributes to the promotion of common goals and effective functioning within a social context (Organ, 1997; Konovsky and Pugh, 1994). In addition, intentions to start a new entrepreneurial activity are

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also affected by the pursuit of economic profits (Giacomin et al, 2011). Finally, in her study, Som Castellano (2017) found that farmers' environmental concern is associated with the possibility of participating in alternative food distribution schemes. Hence, we also examined the influence of producers' citizenship behavior, their perception on the potential economic benefits from participation, and their environmental concern in their willingness to engage in SFSCs.

In our second study we focused on the reverse relationship. In other words, we examined whether participation in SFSCs leads to an increase of competency needs. Nevertheless, given that research provides some evidence that farmers' sociodemographics and the size of their farm enterprises affect their competencies (Therriault et al, 2017; Lawrence and Ganguli, 2016), we also controlled for farmers' gender, age, level of education, and size of the cultivated land.

Study 1

Methods

Participants

For this study we used data from a sample of 106 farmers (70.8% men) who live and work in the region of Thessaly (Greece). The mean age of participants was 40.1 years (S.D.=11.5, range from 19 to 64 years), whereas 72 of them were secondary educated (67.9%). The cultivated land per farmer ranged from one to 35 hectares, with smaller farms to be the usual case (mean score=6.01 hectares). Participants were asked to complete a set of measures presented in the section that follows.

Measures

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To measure participants' willingness to participate in SFSCs we used a single item. Participants were asked to express their willingness by choosing among five options (at all, a little, moderately, quite a bit, very much).

To assess farmers' citizenship behavior we used four different measures. Three of them were adapted from Farh et al (1997) to assess altruism towards colleagues (e.g. "when I participate in a common project I am willing to help colleagues solve work-related problems"), identification with a group of colleagues (e.g. "when I participate in a group project I am willing to stand up to protect the reputation of the group"), and interpersonal harmony (e.g. "when I participate in a common project I never use illicit tactics to seek personal influence and gain with harmful effect on interpersonal harmony in the group"). Each scale consisted of three items. Moreover, participation culture – another aspect of citizenship behavior – was assessed using four items derived from Camisón (2005). An example item was "when I participate in a common project I follow the group norms and the standards of behavior." Response options ranged from one (completely disagree) to five (completely agree). Reliability analysis confirmed satisfactory alpha coefficients for all the four scales ($\alpha > 0.70$).

A single item was used to assess producer's beliefs about the economic benefits of participation in an SFSC ("Participation in an SFSC can lead to higher farm income"). A five-point Likert scale – ranging from "completely disagree" to "completely agree" was used.

To operationalize participants' environmental concern we used Bamberg's (2003) Environmental Concern Scale. The measure consists of eight items developed to depict subjects' concerns over the future of natural environment. An example item is "If we continue as before, we are approaching an environmental catastrophe." Items were measured using a five-point scale ranging from "completely agree" to "completely disagree." All items were found to load on a single factor accounting for 46.31% of the total variance

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(eigenvalue=3.71). Cronbach's alpha for the scale was 0.83. A total environmental concern score was calculated for each participant by averaging the eight items.

To assess the levels of farmers' self-perceived competencies we developed a list of 17 items (Table 1) which are related to factors determining the success of alternative food networks. Items were developed after an extended literature review in the fields of alternative food networks and entrepreneurial competencies. A principal axis factor analysis with varimax rotation revealed a five-factor structure. Cumulatively, the five new sub-scales explain 78.7% of the total variance (Table 1).

Plan of analysis

To analyze our data we used descriptive and inferential statistics. Pearson's correlations and Mann-Whitney tests were used to test for associations between pairs of variables. Potential predictors of willingness to participate in SFSCs were entered in a hierarchical regression analysis. This way we examined the relative contribution of each set of factors in farmers' willingness.

Results

Preliminary analysis

The summary statistics for the key study variables were presented in Table 2. No gender effects were observed on the variables of interest. Age was found to significantly correlate only with environmental concern ($r=-0.25$, $p=0.010$), whereas both age and level of education were not associated with citizenship behavior and felt competencies. Interestingly, willingness to participate in SFSCs was found to be independent on age

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($r=0.02$, $p=0.824$), level of education ($r=-0.06$, $p=0.551$) and size of the cultivated land ($r=0.05$, $p=0.567$). Moreover, Mann-Whitney's test revealed no differences between men and women farmers on their willingness to participate in short supply chains ($U=1,096$, $p=0.633$).

Main analysis

The analysis revealed that all the four dimensions of citizenship behavior correlate with farmers' willingness to participate in SFSCs. Pearson's correlation coefficients received values of 0.22 for participation culture ($p=0.021$), 0.25 for identification ($p=0.009$), 0.29 for altruism ($p=0.003$), and 0.36 for interpersonal harmony ($p=0.0001$). Moreover, all the variables referred to the levels of farmers' competencies positively correlate with willingness ($p<0.01$), whereas the correlation between willingness and environmental concern is also significant and positive ($r=0.19$, $p=0.048$). Finally, a positive correlation was found between farmers' willingness to participate in SFSCs and their perception that engagement in such chains can bring economic gains ($r=0.24$, $p=0.012$).

To examine the relative effect of these variables on farmers' willingness to participate in SFSCs we developed a hierarchical regression analysis model. In the first step we entered the four dimensions of citizenship behavior. In the second step, the variable referred to farmers' perception on the economic benefits of taking part in an SFSC was added. At step 3 we entered environmental concern, whereas the five constructs which refer to participants' competencies were added at step 4. The analysis confirmed that, with the exception of environmental concern for which ΔR^2 was marginally non significant ($p=0.055$), the other three sets of predictors contribute significantly to the model. The R^2 change was 0.18 for citizenship behavior ($\Delta F=5.68$, $p=0.0001$), 0.05 for perception on the economic benefits ($\Delta F=5.98$, $p=0.017$), and 0.32 for the levels of competencies ($\Delta F=14.43$, $p=0.0001$). As the Table 3 shows, in the final model only the beta coefficients for the five sets of competencies were significant. Scores on interpersonal harmony and altruism were

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marginally non-significant, whereas the remaining variables yielded lower beta values. These results indicate that, among the examined variables, farmers' competencies have the highest contribution in predicting willingness to participate in SFSCs.

Study 2

Methods

Participants

Data for this study were drawn from two samples of farmers. The first sample consists of 33 farmers who participate in SFSCs and the second sample of 38 producers who distribute their products through conventional marketing channels. All the surveyed farmers own farm enterprises that are located in the region of Thessaly (Greece). The mean age for the total sample was 41.8 years (S.D.=9.3, range from 24 to 62 years), whereas 71.8% of them were men. More than the two-thirds of the subjects had secondary education (67.6%). The average size of the cultivated land was 4.03 hectares (S.D.=2.9) and the mean farm income per farm family was €13,408 (S.D.=4,674). No significant differences were found between the two samples on gender (Fisher's $p=0.338$), whereas Mann-Whitney test revealed no differences in the level of education ($U=559.5$, $p=0.346$). Independent sample t-test confirmed that the two groups did not differ in age ($t=1.95$, $p=0.055$). Nevertheless, the analysis indicated that participants in SFSCs hold larger farms ($t=-3.48$, $p=0.001$, mean difference=2.38 hectares).

Measures

To assess competency needs of farmers we used the scale we developed in our first study. Participants were asked to assess their needs on each one of the 17 items using the same

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one to five scale. A varimax rotated factor analysis uncovered the same factorial structure for the scale. The five sub-scales cumulatively explain 75.7% of the total variance. Mean scores and standard deviations for the sub-scales are presented in the Table 4.

Plan of analysis

To examine whether participation in SFSCs affects farmers' needs for new competencies, we followed a hierarchical regression strategy. The five constructs referring to the categories of competency needs were used as response variables. In the first step of each regression we added gender, age, education, and the size of cultivated land as control variables. Then, we added the binary variable indicating whether farmers participate (value: 2) or no (value: 1) in an SFSC.

Results

The standardized beta coefficients for the five regressions (Table 5) revealed that participation in SFSCs generates the need for new competencies. In all the models the sign of beta coefficient for participation is positive, suggesting that participation in SFSCs leads to an increase in the needs for competencies. The changes in R^2 after entering the variable referring to participation were in all cases statistically significant ($p < 0.05$). It is also noteworthy that age emerged as a significant predictor in the first model and the size of cultivated land also yielded a significant beta coefficient in the model for cooperation competencies, but their contribution in the variance of the dependent variables diminished after entering the second set in the models.

These results support the hypothesis that participation in SFSCs generates new competency needs in farmers. In the regressions for marketing, networking, management and entrepreneurial competencies the beta coefficients correspond to p-values of 0.01 and

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below, indicating a very strong association between participation in short food supply schemes and these four types of competencies.

Conclusions

The present set of studies examined the association between participation in SFSCs and farmers' competencies. Study 1 uncovered that levels of self-perceived competencies predict farmers' willingness to participate in SFSCs, even when controlling for other factors that also have an effect on this willingness, namely citizenship behavior, perception of the economic benefits associated with participation in SFSCs, and environmental concern. These results indicate that felt deficiencies in competence discourage producers' engagement in SFSCs, confirming work from the field of entrepreneurship research which points to a strong link between competencies and entrepreneurial intentions (Obschonka et al, 2010). On the other hand, the finding that felt competencies are more important in predicting willingness than citizenship constructs signalize that, despite the pivotal role of social cohesion and collectivity for the success of alternative supply schemes (Berti and Mulligan, 2016), the expansion of SFSCs depends mainly on farmers' operant resources. This observation calls for a more nuanced research on the types of competencies needed by producers to effectively operate within the framework of an SFSC. In addition, our analysis lends support to findings from business research (Şeşen and Pruett, 2014), confirming that the expectation of economic benefits is not the main reason leading producers to engage in SFSCs, and that individuals' competencies predict intention to engage in new activities.

At the other end of the spectrum, these findings indicate the need for a shift in policy emphasis from the offering of economic incentives to the opening of opportunities for farmers to attain and develop new competencies, especially those referred to intra-community networking and cooperation capacities, marketing and management skills, and entrepreneurial capabilities. Our second study further supports this argument, by showing

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that participation in SFSCs increases farmers' competency needs. The vertical integration of supply chain functions by the producers in SFSCs (Carbone, 2018; Chiffoleau, 2009), amplifies these needs – and perhaps creates new mastery needs – which should be met by appropriate extension interventions. Nonetheless, to date, extension thinking continues to be anchored to conventional production and marketing approaches, paying thus limited attention on the needs and demands of farmers who follow alternative routes of food production and distribution (Chiffoleau et al, 2016).

To sum up, in spite of the limitations arising from the small sample sizes, the pair of studies presented herein contributes to the debate on SFSCs by offering considerable support for the importance of farmers' competencies on the development of short supply schemes. Although future researchers can add other factors that might also affect farmers' participation in SFSCs, our work indicates that to promote and sustain the development of SFSCs it is essential to focus on the issue of farmers' competencies. Diagnosing and scanning farmers' competency needs, and offering opportunities for farmers' competence development could facilitate both producers' engagement with and persistence in these alternative food supply schemes.

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