DETERMINANTS OF FARMERS' WILLINGNESS TO JOIN SHORT CHAINS IN ROMANIA

Raluca Andreea ION[1], Georgiana Raluca LADARU[2], Ionut Laurentiu PETRE[3], Daniela POPA[4]
[1] Professor, PhD, Department of Agrofood and Environmental Economics, Email: raluca.ion@eam.ase.ro
[2] Associate Professor, PhD, Department of Agrofood and Environmental Economics, Email: raluca.ladaru@eam.ase.ro
[3] Assistant PhD, Department of Agrofood and Environmental Economics, Email: laurentiu.petre@eam.ase.ro
[4] PhD Faculty of Agrofood and Environmental Economics, Email: daniela.popa63@gmail.com

Abstract
Worldwide, smallholder farmers are encouraged to join short chains or to organize themselves into different forms of association. The main reasons are related to empower negotiation across the agro-food chains, market entry barriers, and reducing transaction costs. The objective of this paper is to identify the determinants of the farmers' willingness to join a short supply chain. In order to achieving this goals, a survey has been carried out and the correlations between variables have been analyzed using the contingent coefficients. The results indicate that the probability of farmers' membership in a short supply chain is determined by gender, domain of study, domain of activity and form of business organization and less by age, education and environment. The current study contributes to the literature by analyzing the determinants of short supply chain formation using the results of a survey and the finding may be used to underpin macroeconomic measures to finance collective actions in food supply chains.

Keywords: *short chain, survey, smallholder farmers, association.*
DOI: 10.24818/CAFEE/2022/11/03

Introduction

The paper studies the topic of short chains, presenting the results of a survey aimed at identifying the willingness of farmers to form short chains. The research question is what factors determine the formation of short chains, assuming the hypothesis that socio-demographic and economic variables influence farmers' decision. The objectives of the research are to identify the determinants of the short chain formation process and the extent to which they influence farmers' decision to join a short chain. Considering that the association of economic operators within a short chain can lead to the consolidation of social and economic relations in rural communities (Popa, 2022), we can argue that the topic is not only up to date, but also important for the final goal of improving performance within the agro-food system.

The topic of the agro-food chain and short chains has been addressed in numerous specialized works (Ion, 2005, Manole et al., 2005a, Manole et al., 2005b, Turek et al., 2007 etc.). Starting from specialized studies (Malassis et al., 1992), in which the supply chain on a product or a group of products is the set of activities and functions carried out by economic operators from the use of raw materials to obtaining the product intended for the final consumer, it can be defined the short chain. Within the main activities: production, collection, transformation, distribution and consumption, if it is possible to shorten the links so that there is only one

intermediary between the producer of the agro-food product and the consumer, then one can consider it a short chain.
The short chain is defined by European legislation (Regulation EU no. 1305/2013) as a local cooperation structure in which several economic operators with different activities contribute to the economic development of the area, starting from the use of raw materials, to the processing and distribution of products to consumers.
What characterizes the short chain model is the fact that it implies the existence of a single intermediary between the agricultural producer and the consumer. Under these conditions, the activities of collection, sorting, processing, storage and transport of agro-food products are taken over by the producers, brought together in an associative form. This associative form is justified not only for empowering the economic and financial situations of farmers, which facilitates the realization of investments and finances the activity of farmers, but also for strengthening their negotiator's position within the chain. The short chain involves the integration of activities both vertically and horizontally, by associating producers from the same level of the chain, in an associative form, in order to acquire the economic power necessary to carry out the multitude of assumed activities (Marin et al., 2018).
The attempts to shorten the supply chains are encouraged and financed by the Ministry of Agriculture and Rural Development of Romania, through the National Program for Rural Development (PNDR). From the analysis of the PNDR support measures in the period 2018-2020, it is found that there are measures aimed at activities that lead to the proper functioning of a "short food chain", to ensure an associative form, within which the activities are very well defined on the link raw material – processing – marketing – consumer (such as: 4.2 - Support for investments in the processing / marketing of agricultural products, 9.1 - Establishment of producer groups, 16.4 - Support for horizontal and vertical cooperation between actors in the supply chain, in order to establish and develop short supply chains and local markets, as well as to carry out related promotional activities in a local context etc.).
The sub-measures 16.4 and 16.4a, whose beneficiaries can access a non-refundable support of 100% of the total eligible expenses, have a total budget of 40 million euros, while sub-measure 16.4a has a budget of 10 million euros. The maximum amount of support that can be accessed through sub-measures 16.4 and 16.4a is 250,000 euros (National Program for Rural Development, 2022).
The work is structured into four parts. After the introduction, the research methods are presented and the data collected from the survey are analyzed. In the third part, the data are processed with the help of computer programs and the relationships between the dependent and independent variables are studied. In the last part of the paper, conclusions are drawn up.

1. Materials and methods

The purpose of the research is to know the perceptions of agricultural producers on the integration of the activity in a short chain considering that, in this way, the economic performance can be improved in the entire agro-food system.
To achieve this goal, a quantitative research was carried out, using the survey as an investigation technique, and the questionnaire as an instrument. The researched population consists of farmers from Romania, aged between 18 and 65 years, male and female, who carry out agricultural and processing activities. The survey unit is represented by the farmer, called the respondent during the research. Inclusion in the sample was achieved through the voluntary, freely expressed consent of persons, legal representatives of agricultural and/or food processing businesses. The survey was conducted in April 2022, with a response rate of 23.86%.

According to the results of the questionnaire, the sample consists of farmers with the following characteristics: most of the respondents are represented by men (52.4%), but the percentage of women is also very close to half of the respondents (47.6%). The largest share of respondents is between 35-65 years old (78.13%), followed by those under 35 years old (17.1%), while 4.8% are over 65 years old. The level of education of the respondents is structured as follows: 37.1% university studies, 36.2% postgraduate studies, 26.7% high school studies. Regarding specialization in education: most of the respondents are active in agriculture, 28%, 26% in food industry, 7% horticulture, and the rest of 39% is distributed, under a percentage of 2%, to other specializations: agricultural mechanics, chemistry, ecology, agricultural administration, animal husbandry, engineering, sociology, law, construction, etc. As regards the area of the farm owned/leased: most of the respondents 35% do not operate any agricultural area, while 32.4% own/lease an area of less than 10 ha, 21.0% own/lease an area between 10 - 50 ha, 4.8% own/rent an area between 50 - 100 ha, and a percentage of 6.7% own/rent an area of more than 100 ha. Most of the respondents, 56.2%, do not own animals and 43.8% have animals.

The dependent variable is the integration of the activity in the short chain. Question 19 – Is the activity of your holding integrated on a short chain of exploitation of agricultural products? (short chain - the final product reaches the consumer directly, possibly through a single intermediary). Most of the respondents, in percentage of 65.7%, believe that the farm's activity is integrated on a short chain of exploitation of agricultural products, and 34.3% do not fit the activity on a short chain of exploitation.

If the answer is yes, the farmers have been asked to what extend do they consider the short chain functional, compared to other forms of output valorization. The largest part of farmers considers it very functional (32.4%), 21.9% functional, 9.5% less functional, 3,8% very less functional, and 32.4% answered that it is not the case.

2. Results and discussions

Using the SPSS statistical program, the correlation between the dependent and independent variables has been analyzed. In the case of the studied variables, the value of the chi-square test did not exceed the value of 0.05. The link between the variables was analyzed according to the value of the contingency coefficient (Phi or Cramer's V). According to it, the relationship can be weak, if the contingency coefficient is below 0.3, average, if it is located between 0.4-0.6, or strong, at a coefficient value between 0.7-0.9.

SPSS Statistics Software was used in the research, both the chi-square test for evaluating the existence of a significant difference between two samples consisting of frequency data (nominal data), and obtaining the Phi coefficient which, by the resulting value, tests the association between variables. Association or contingency were analyzed based on two nominal categorical variables between the independent and dependent variables. At the same time, in SPSS program, it was asked to obtain the Phi Coefficient that shows the association between two nominal variables.

It will be checked the hypothesis that the integration of the activity of agricultural producers in a short chain (question 19) depends on the independent variables considered at the beginning of the research: age, education, specialization in education, specialization in production, the form of organization, the environment in which the activity is carried out, the area and the livestock owned/exploited.

Table 1 shows that the relationships between the respondents' gender and the integration of agricultural activity in short chains is strong. There is no significant difference between the observed and expected frequencies in the case of genders regarding the integration of the activity on a short chain of products' valorization. The reporting and direction of the results

can be done in this way: 69% use a short chain for output valorization, of which 33% female and 36% male.

Table 1. Relationships between the respondents' gender and the integration of agricultural activity in short chains

Independent variable	Dependent variable	Phi coefficient value (testing the association between variables)	Contingence coefficient value	Relationships intensity
What is your gender? - Male - Female	Is the activity of your farm integrated on a short chain of valorization of agricultural products? - Yes - No	0.953	0.953	Strong

Source: computation based on the results of the survey

Table 2. Relationships between the respondents' age and the integration of agricultural activity in short chains

Independent variable	Dependent variable	Phi coefficient value (testing the association between variables)	Contingence coefficient value	Relationships intensity
What is your age? - <35 years - 35-65 years - >65 years	Is the activity of your farm integrated on a short chain of valorization of agricultural products? - Yes - No	0.167	0.169	Weak

Source: computation based on the results of the survey

The relationships between the respondents' age and the integration of agricultural activity in short chains (Table 2) is weak. Significant differences were recorded for the link between age and short chain integration, for the three groups (<35 years, >65 years and on the 35-65 years' interval). Out of the 69% respondents who are carrying out activities on short chains, 51% are 35-65 years old, 15% under 35 years old and 3% over 65 years old.

The relationships between the respondents' education and the integration of agricultural activity in short chains (Table 3) is weak. There was a significant difference between the observed and expected frequencies in the case of the form of education. Out of the 69% of respondents who are carrying out activities on short chains, 23% have postgraduate studies, 24% university studies, and 22% high school studies.

Table 3. Relationships between the respondents' education and the integration of agricultural activity in short chains

Independent variable	Dependent variable	Phi coefficient value (testing the association between variables)	Contingence coefficient value	Relationships intensity
What is the last form of education completed? - High school - University - Postgraduate	Is the activity of your farm integrated on a short chain of valorization of agricultural products? - Yes - No	0.164	0.161	Weak

Source: computation based on the results of the survey

Table 4. Relationships between the respondents' domain of study and the integration of agricultural activity in short chains

Independent variable	Dependent variable	Phi coefficient value (testing the association between variables)	Contingence coefficient value	Relationships intensity
In which field do you have specialized studies?	Is the activity of your farm integrated on a short chain of valorization of agricultural products? - Yes - No	0.528	0.467	Medium

Source: computation based on the results of the survey

The relationships between the respondents' domain of study and the integration of agricultural activity in short chains (Table 4) is medium. Respondents with studies in the field of agriculture (17%) and food industry (16%) choose to integrate their activity into short chains as form of output valorization.

The relationships between the respondents' domain of activity and the integration of agricultural activity in short chains (Table 5) is medium. Respondents who carry out current processing activities (13%) and those who produce raw materials (12%) have the smallest difference between the frequencies observed and those expected by the chi-square test.

Table 5. Relationships between the respondents' domain of activity and the integration of agricultural activity in short chains

Independent variable	Dependent variable	Phi coefficient value (testing the association between variables)	Contingence coefficient value	Relationships intensity
Which of the following activities do you currently carry out?	Is the activity of your farm integrated on a short chain of valorization of agricultural products? - Yes - No	0.598	0.513	Medium

Source: computation based on the results of the survey

Table 6. Relationships between the respondents' form of organization and the integration of agricultural activity in short chains

Independent variable	Dependent variable	Phi coefficient value (testing the association between variables)	Contingence coefficient value	Relationships intensity
What is your form of organization?	Is the activity of your farm integrated on a short chain of valorization of agricultural products? - Yes - No	0.483	0.435	Medium

Source: computation based on the results of the survey

The relationships between the respondents' form of organization and the integration of agricultural activity in short chains (Table 6) is medium. Out of the 69% of respondents who carry out current activities on a short chain, 24% are organized in the legal form SRL and 15% as physical persons with a producer certificate.

The relationships between the respondents' environment (urban vs. rural) and the integration of agricultural activity in short chains (Table 7) is weak. Out of the 69% of respondents who carry out their current activities on a short chain, 51% are in rural areas and 15% in urban areas.

In Tables 1-7, the effect size, or the size of the association between the two variables, is given in the Symmetric Measures table in SPSS, for the Phi or Cramer's V value.

Table 7. Relationships between the respondents' environment (urban vs. rural) and the integration of agricultural activity in short chains

Independent variable	Dependent variable	Phi coefficient value (testing the association between variables)	Contingence coefficient value	Relationships intensity
Where do you develop your activity? - Urban - Rural	Is the activity of your farm integrated on a short chain of valorization of agricultural products? - Yes - No	0.257	0.249	Weak

Source: computation based on the results of the survey

Conclusions

Farmers' willingness to join short chains depends on several variables, whose influence is strong, medium or weak. Farmers' gender has a strong influence on their willingness to join short chains, men have a greater inclination to integrate the agricultural activity on short chains than women. Farmers' domain of study, domain of activity and form of business organization have medium influence on their willingness to join short chains. Respondents with studies in the field of agriculture and food industry, those who carry out current processing activities and produce raw materials and are organized as SRL choose to integrate their activity into short chains. Age, education and environment have weaker influence on farmers' willingness to join short chains, but, generally, the farmers who want are 35-65 years old and live in rural areas.

These results are similar to those found by other researchers (Andrei et al., 2019), who argued that the affiliation of Romanian farmers to a short supply chain is determined by the type of activity, the size of the holding and the level of education.

The findings are useful for underpinning macroeconomic measures, especially when significant amount of money (like those appointed to the measure 16.4) are oriented towards short chain formation in Romania.

Future research should analyse the consumer's perspective for the products existing today in the food retail, comparing products from local producers, delivered through short chains, and those from large international holdings.

References

1. Andrei, J., Ion, R.A., Chivu, L., Pop, R. E., & Marin, A. (2019). Investigations on farmers' willingness to associate and join in environmental responsible short supply chain in Romania. *Applied Ecology and Environmental Research, 17*(2):1617-1639, doi:10.15666/aeer/1702_16171639
2. Ion, R.A. (2005). Performanta economica a sistemului agroalimentar românesc. [The economic performance of the Romanian agri-food system]. Editura Ceres, Bucuresti.
3. Malassis, L., Ghersi, G., collectif. (1992). Initiation a l'economie agro-alimentaire. Editura Haitier, Paris.

4. Manole, V., Istudor, N., Boboc, D., & Ion, R., A. (2005). Filiere agroalimentare. [Agro-food chains]. Editura ASE, Bucuresti.
5. Manole V., Stoian M., Boboc D., Ion R. A., Berevoianu R., & Turek A. (2005). Marketingul pe filiera vinului în România. [Marketing on the wine chain in Romania], Editura ASE, Bucuresti.
6. Marin, A., Ion, R. A., Chetroiu R., & Iurchevici L. (2018). Ghid practic pentru înființarea unui lanț scurt de valorificare a producției de legume si fructe. [Practical guide for the establishment of a short value chain for the production of vegetables and fruits]. Editura ASE, Bucuresti.
7. Popa, 2022. Modele de lanțuri scurte pentru produsele agroalimentare. [Short chain models for agri-food products], PhD thesis, The Bucharest University of Economic Studies.
8. Regulation (EU) no. 1305/2013 of the European Parliament and of the Council of 17 December 2013 regarding support for rural development granted from the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulation (EC) no. 1698/2005 of the Council, https://eur-lex.europa.eu/legal-content/RO/TXT/?uri=CELEX%3A32013R1305
9. Turek Rahoveanu, A., Zahiu, L., Turek Rahoveanu, M., Alexandri, C., Popescu A., Dachin, A., & Ion, R. A. (2007). Competitivitatea pe filiera cerealelor panificabile. [Competitiveness in the grains sector]. Editura Ceres, Bucuresti.