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THE RESILIENCE OF AGRICULTURAL COOPERATIVES IN THE COVID-19 PANDEMIC TIME. EVIDENCE FROM ROMANIA

ABSTRACT

Although the role of agricultural cooperatives in supporting farmers to improve their positioning in the value chain is recognized, in Romania only 1% are members in associative structures, the cooperative system being quite poorly developed. However, despite the sudden onset and magnitude of the pandemic shock, many agricultural cooperatives have managed to adapt and mitigate the effects on their members, as evidenced by the analysis by counties, regions and nationwide of the evolution of some indicators of their economic activity, for the last 3 years with submitted balance sheets (2018–2020). In most regions, the reported total net profits were higher than the losses recorded, with a significant role being played mainly by second-tier cooperatives, which were better integrated into the agri-food system and, as a result, more resilient. By development regions, it was found that the most profitable cooperatives were located in the Nord-Vest and Sud-Muntenia regions.

The highest average turnover was noticed in the Sud-Est and Nord-Vest. The areas of activity with the highest average turnover values were: poultry raising; wholesale trade in meat and meat products; wholesale trade in fruit and vegetables; processing and preserving fruit and vegetables; growing cereals (except for rice), leguminous crops and oilseeds; wholesale of live animals; wholesale trade in dairy products, eggs and edible oils and fats; growing bush fruits, strawberries and nuts. The large number of agricultural cooperatives established in 2021 (737, compared to those recorded throughout the period 2005–2020, 1749) shows that farmers have begun to believe in the benefits of the cooperative system and consider that by association they are better protected from the shocks they have to deal with in the agri-food system, especially in unforeseen conditions, such as those caused by the COVID-19 pandemic.

Key words: agricultural cooperative, resilience.

JEL Classification: Q13.

1. INTRODUCTION

At the end of 2019, the COVID-19 (SARS-CoV-2) pandemic exposed the global economy to unusual pressures and challenges, with agricultural markets and supply chains being also severely affected. The degree to which the operation of supply chains was disrupted differed depending on: products, degree of supply

organization, product perishability, characteristics of agri-food chains, storage capacities, degree of producers' integration of producers in capitalization chains, etc. There were sectors where the shocks were more strongly felt, capitalization not being ensured by contracts with retailers or processing factories, as was the case in the fruit and vegetable sector (Alexandri, 2020). However, in this sector and not only, the agricultural cooperatives also recorded large profits, as we will show in this paper, being a clear proof that they can be a way to ensure the resilience of the agri-food system and farms, in times of crisis, because they can ensure more efficient organization of production, increase bargaining power and improve the positioning of farmers in the value chain.

2. STATE OF KNOWLEDGE

Resilience is a concept that refers to the ability of a system to persist through change, including the ability to maintain its current state despite economic, social, environmental and institutional disruptions and shocks, and its ability to adapt and transform (Meuwisen *et al*., 2019; Darnhofer, 2021). Farm resilience studies generally focus on identifying factors that facilitate their adaptation to changing conditions, both on and off the farm. It has been shown that farm resilience can be influenced by available resources, workload, knowledge, and power in agri-food value chains (Darnhofer, 2020). In recent studies, the resilience of agricultural systems and farms has been defined as "their ability to ensure that they fulfil their essential functions in the face of increasingly complex and volatile economic, social, environmental and institutional challenges; their ability to withstand shocks, to adapt and to transform as a result through characteristics of robustness, adaptability and transformability" (Gavrilescu *et al*., 2021a; Meuweisen *et al*. 2018). Robustness is considered to be the ability of the farm to withstand challenges, stressors and shock absorbers, without affecting its normal activity and without significantly diminishing its efficiency and viability; adaptability is the ability of the farm to cope with challenges, stressors or shocks by introducing changes (technological, managerial, etc.) so that it can continue its normal activity; transformability refers to the ability of the farm to cope with stressors and severe shocks through profound, radical changes in the structure and profile of the business, in the internal functioning mechanisms and in relations with external agents and the market, changes that ensure the economic viability of the farm (Meuweisen *et al.* 2018; Gavrilescu *et al*., 2021b).

In the Romanian rural area, the microeconomic systems with the highest resilience are the small farms because the lack of a strict specialization in production and the low degree of dependence on external influences (specialized markets, financial dependence on banks, input providers, etc.) allow them to quickly change the direction of production according to market requirements, without having to change too much their business model in order to survive

economically (Gavrilescu, 2022). However, current agricultural policies in Romania are too poorly adapted to the needs of small farms. They need to be adapted to facilitate the association of small producers, to facilitate access to agri-food chains, to simplify land market legislation and easier access to finance, development projects and, last but not least, to improve the quality of policy implementation in Romania (Gavrilescu, 2022).

An important way to increase the resilience of small farms might be association and cooperation, especially in the context of unforeseen economic crises and fluctuations, as shown in various recent studies (Smith & Rothbaum, 2013; Kontogeorgos *et al.*, 2016; Fusco & Migliaccio, 2018; Michie *et al.*, 2017; Francesconi *et al.*, 2021). Occasionally, it is possible to build on existing traditional forms of cooperation as a way of addressing new issues that those affected have to face with (Parnell, 2001). Moreover, the cooperative model is considered to be better prepared for resilience and recovery because: cooperatives put members and the community first; are able to share risks; contribute to increase members' incomes; build social connections and build a high level of trust; facilitate effective communication between members; support the sustainable development of local production and the communities (BCCM, 2021).

During the global COVID-19 pandemic, cooperatives have shown adaptability and flexibility (EURICSE, 2020), with many cooperatives on every continent taking steps to make their business more sustainable and to help communities in general. At the same time, it was found that cooperative units are more resilient only if the cooperative principles are legally incorporated into their status, adopted and functional (Billiet *et al.*, 2021). These principles, currently valid, are the following: voluntary and open membership; democratic member control; member economic participation; autonomy and independence; education, training and information; cooperation among cooperatives; concern for community (ICA, 2015).

As a study on the economic and social impact of the COVID-19 pandemic crisis on co-operative organizations in Europe by Cooperatives Europe (2021) shows, all the analysed entities, regardless of their size, found changes in their business, turnover and labour. The impact was different depending on the field in which they were active. Those in transport, tourism, education, culture, sports and, in general, the start-ups have been severely affected, sometimes being forced to cease operations or declare bankruptcy. On the other hand, those in health, textiles and retail trade recorded significant increases in turnover. With regard to agricultural cooperatives, the study states that, especially those who have found innovative ways to meet the challenges have managed to develop (an example is an agricultural cooperative in Bulgaria which, by setting up mobile shops in villages, managed to provide fresh products at affordable prices).

According to the annual report of the United States Department of Agriculture on the activity of agricultural cooperatives for 2020 (USDA, 2021), the financial data of 1744 agricultural and fishing cooperatives revealed an increase in net income despite the overall decrease in the number of cooperative units (from

1779 in 2019 to 1744 in 2020) and the pandemic crisis. A record $ 8.4 billion in net income was reached. Most cooperatives (915 cooperatives) marketed commodities (52.5%), 829 cooperatives supplied farmers with inputs, and 87 cooperatives provided services (storage, transportation, etc.). A long-standing co-operative system (with 17.5% of agricultural co-operatives lasting more than 100 years) has proved its effectiveness, and the positive results of 2020 prove that co-operative units owned and governed by members will continue to be as important as ever for American producers and the agri-food system and the communities they belong to (USDA, 2021).

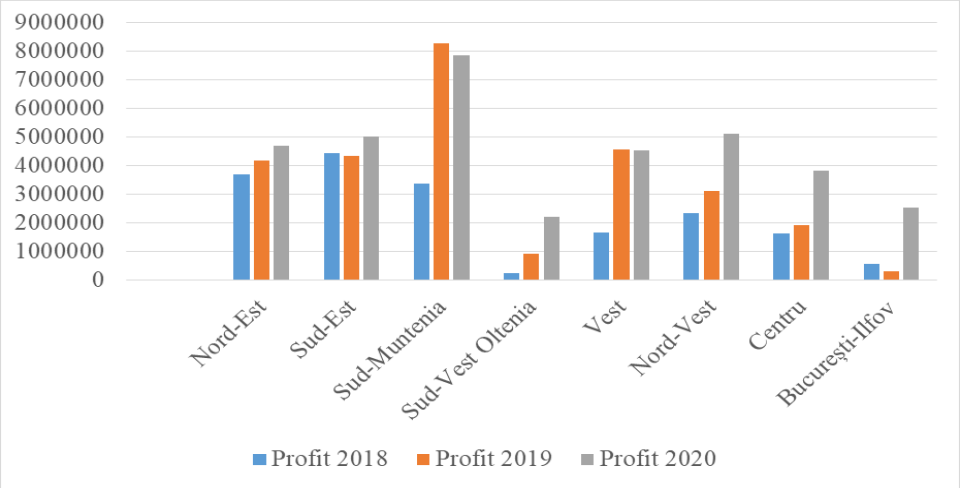
But what happens in countries where the co-operative experience has not been so positive, such as the case of Romania? Are the relatively recently established agricultural cooperatives resilient in times of economic crisis? In order to answer these questions, we analysed data on agricultural cooperatives in Romania, following their economic activity for the period 2018–2020 according to the submitted balance sheets, respectively the evolution of agricultural cooperative matriculations according to the data of the National Trade Register Office (NTRO).

3. MATERIAL AND METHOD

In order to carry out this study, we processed and analysed data on the activity of agricultural cooperatives in Romania for the period 2018–2020 extracted from the National Register of Agricultural Cooperatives (NRAC), on the website of the Ministry of Agriculture and Rural Development (September 2021 version) and from the website of the National Trade Register Office (NTRO). Some of the data extracted from the NRAC were processed and prepared for Exploratory Data Analysis (EDA). Founded in the 1970s by J.W. Tukey, EDA refers to the initial investigation of data using statistical and visualization techniques (Tukey, 1977). EDA is a fundamental step in any data analysis methodology (Biecek, 2019). Its main features include dataset summarization (dimensions, type of variables, missing values); missing values profiling; plotting distribution of variables, and data transformation (replacing missing values, creating dummy variables). Because the NRAC database is relatively new and contains errors or missing data, we considered that using EDA to demonstrate the intuitive hypothesis regarding the resilience of agricultural cooperatives in Romania during the crisis caused by the COVID-19 pandemic would be the forerunner step for other types of statistical analysis, this first analysis being an exploratory one. Data import and processing/preparation was performed with the tidyverse ecosystem of packages (e.g. dplyr, tidyr, readr, stringr) which is a combination of high-level design philosophy and low-level grammar and data structures (Wickham *et al*., 2019). Charts were generated with the ggplot2 package (Wickham, 2016) which is also included in the tidyverse. One main advantage of processing and visualizing data with the tidyverse is the high level of versatility combined with little effort required for coding (Fotache *et al.*, 2021).

4. RESULTS AND DISCUSSIONS

As a first step, from the National Register of Agricultural Cooperatives (NRAC) published on the website of the Ministry of Agriculture and Rural Development (September 2021 version), we extracted data on agricultural cooperatives that have submitted balance sheet for 2018, 2019 and 2020. Then we extracted those that made more than zero profit. It turned out that in 2018, 238 cooperatives registered a net profit higher than zero, in 2019, 301 cooperatives, and in 2020, 353 cooperatives were profitable. The highest reported net profit was in the Sud Muntenia Region. But the most important thing is that the registered profit increased significantly in total value in 2020 compared to 2018 (in most cases also compared to 2019), despite the pandemic (Figure 1).



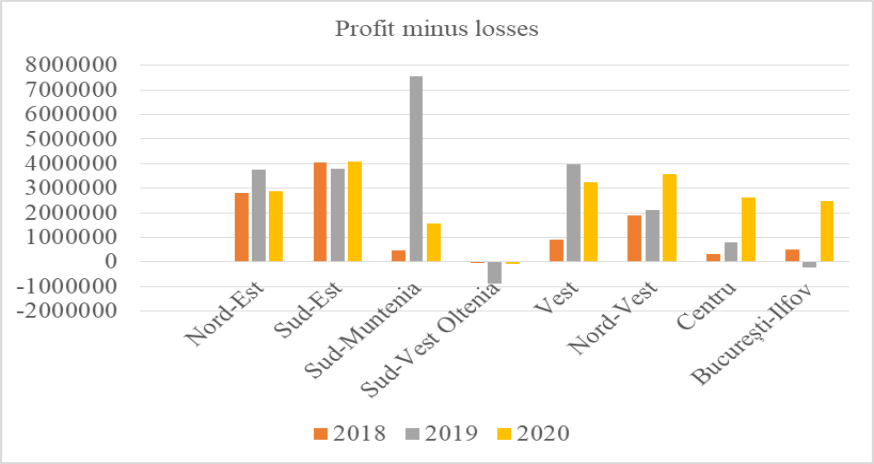
Source: Processing based on the National Register of Agricultural Cooperatives

Figure 1. Net profit registered for the years 2018–2020, by regions

To see if the difference between profit and loss was positive or not, we also analysed these values for each region for the years 2018, 2019 and 2020 (Figure 2). With the exception of the Sud-Vest Oltenia Region, the differences were positive, resulting in fact that, on the whole, we can say that most agricultural cooperatives have managed to generate profits, despite the difficult economic and social situation generated by the pandemic.

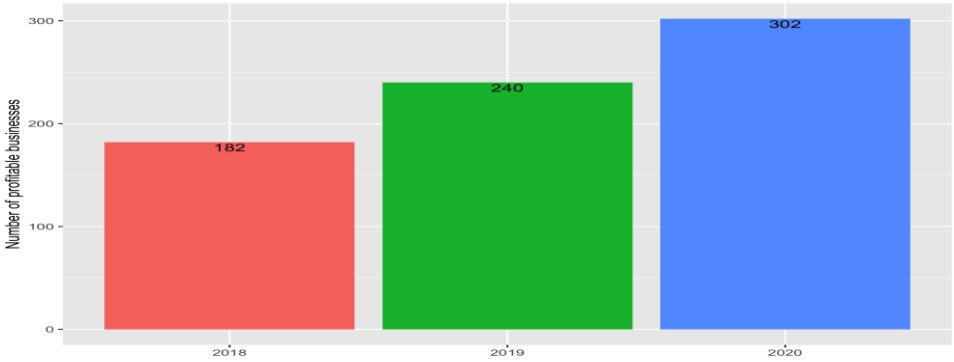
As from previous analyses in the Nord-Est Region (Dobay & Apetroaie, 2021; Dobay, 2021), we found that there are situations in which agricultural cooperatives have significant income even though they have a declared zero turnover, meaning that they manage to attract funds; we considered that, in order to deepen our analysis, it is necessary to extract from the NRAC only those cooperatives that have submitted a balance sheet, registered a profit higher than

zero and declared a turnover higher than zero for the analysed period (2018–2020). We obtained 302 agricultural cooperatives for 2020, an increase compared to 2018 (182) and 2019 (240) (Figure 3).



Source: processing based on the National Register of Agricultural Cooperatives

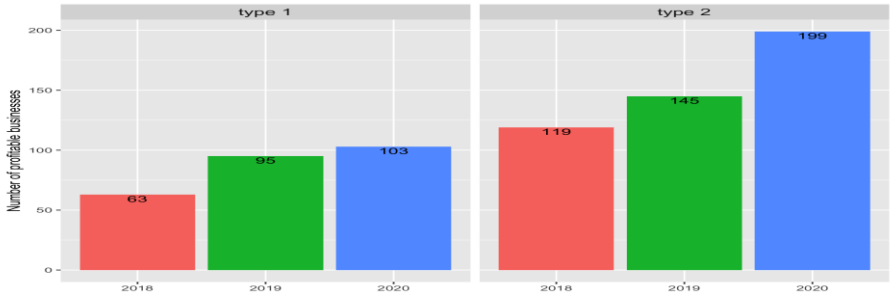
Figure 2. Net profit minus losses for 2018–2020, by regions



Source: processing based on the National Register of Agricultural Cooperatives

Figure 3. Dynamics of profitable agricultural cooperatives

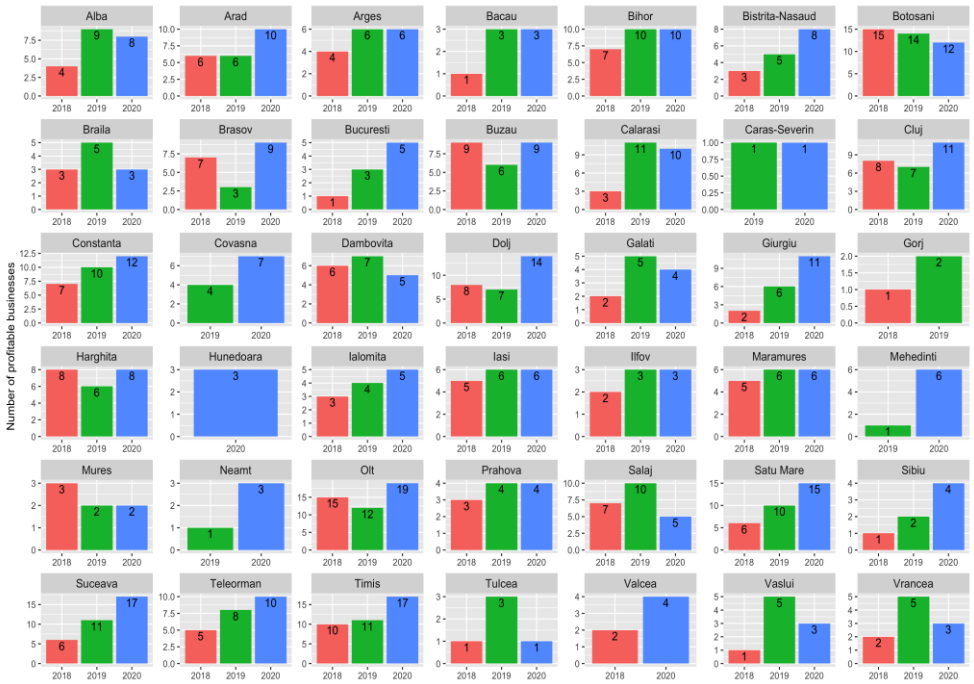
Out of the profitable agricultural cooperatives, most of them (199) are type II cooperatives in 2020. Type I cooperatives consist exclusively of natural persons. The type II cooperatives, with members both natural persons and legal entities, provide a legal structure for the merger of type I cooperatives into larger legal entities. The share of type II cooperatives increased year by year during the period under review, indicating that better horizontal and vertical integration of economic activity means, in most cases, higher chances of making profit (Figure 4).



Source: processing based on the National Register of Agricultural Cooperatives

Figure 4. Dynamics of profitable agricultural cooperatives by types of units

There was a steady increase in the number of profitable agricultural cooperatives in the following counties: Bistrița-Năsăud, Constanța, Giurgiu, Ialomița, Satu Mare, Sibiu, Suceava, Teleorman, Timiș and in Bucharest (Figure 5).

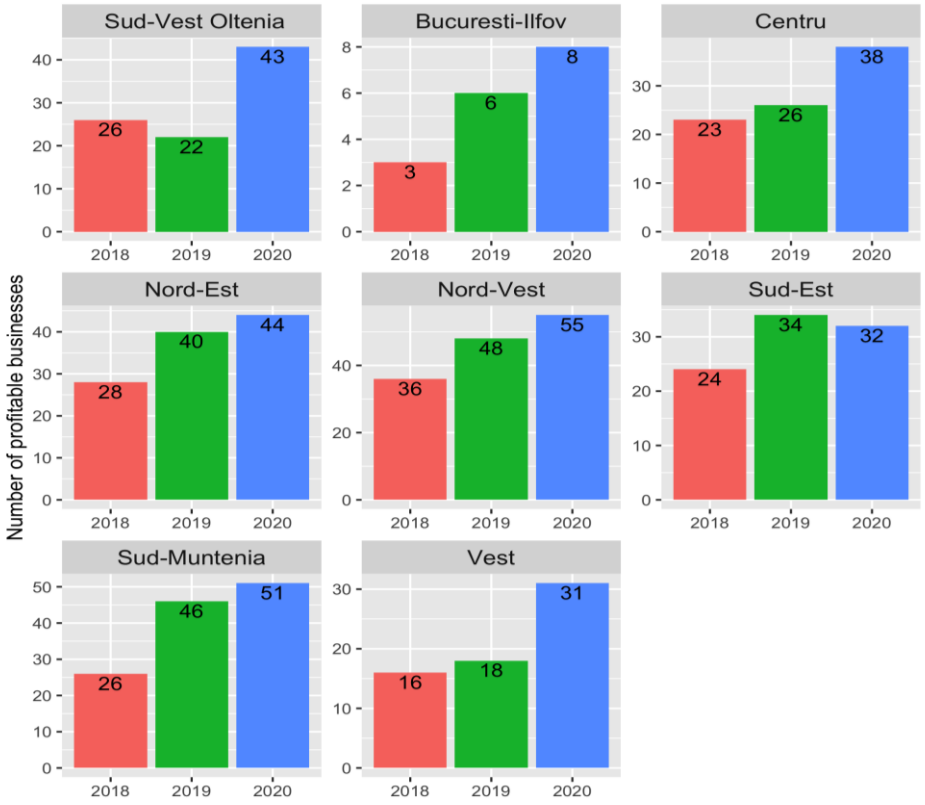


Source: processing based on the National Register of Agricultural Cooperatives

Figure 5. Dynamics of profitable agricultural cooperatives by counties

The largest number of profitable agricultural cooperatives, with a turnover higher than zero in 2020, can be found in the following counties: Olt (20), Botoșani (19), Suceava (18), Timiș (18), Satu Mare (15), Cluj (14), Constanța (12), Călărași (13), Teleorman (13), Harghita (11), Brașov (11), Arad (11), Buzău (11), Giurgiu (11), Bihor (10).

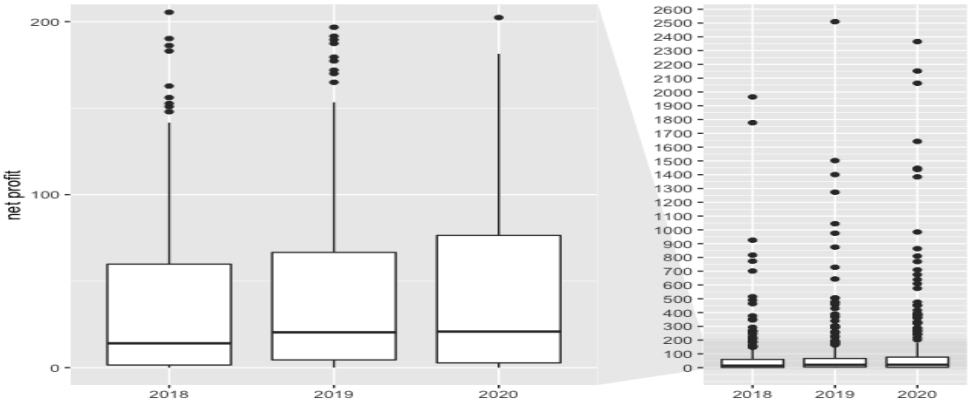
By regions, the most profitable cooperatives, with a turnover of more than zero, are in Nord-Vest (55) and in Sud-Muntenia (51) (Figure 6).



Source: processing based on the National Register of Agricultural Cooperatives

Figure 6. The evolution of profitable agricultural cooperatives, by regions

In value terms, net profits increased overall, but the median in 2020 remained close to that of 2019. The Box Plot chart (Figure 7), by form, indicate that the values taken into account have an asymmetrical (non-normal) distribution, as there are very big differences between the registered profits (from one thousand RON to 2.5 million RON).



Source: processing based on the National Register of Agricultural Cooperatives

Figure 7. Net profit for the years 2018–2020 (thousand RON)

By regions, the average net profit ranged from 7 thousand RON in Sud-Vest Oltenia Region (in 2018) to 315 thousand RON in București-Ilfov Region (in 2020) (Figure 8).

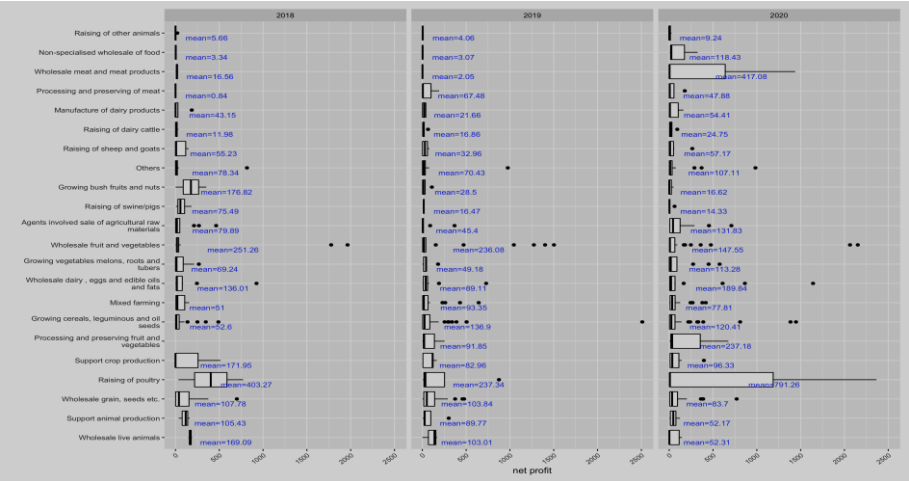
Source: processing based on the National Register of Agricultural Cooperatives

Figure 8. Net profit registered in 2018–2020 by agricultural cooperatives with a turnover higher than zero, by development regions (thousand RON)

In the literature, the most profitable agricultural cooperatives are mentioned in the following sectors: dairy (Hanisch *et al*., 2013; Bijman & Iliopoulos, 2014; Bijman, 2018), vegetables-fruit (Guzmán & Arcas, 2008; Bijman *et al*., 2012), viticulture (Bijman *et al*., 2012), olive oil (Bijman *et al*., 2012), etc. In order to find out the profitable activities and sectors for the agricultural cooperatives in Romania, we continued our analysis and we obtained the following results (Figure 9):

- ✓ in 2018, average profits of over 100 thousand RON were registered in: growing grapes; poultry raising; wholesale trade in fruit and vegetables;

growing other tree and fruit bushes and nuts; support activities for crop production; wholesale of live animals; wholesale trade in dairy products, eggs, and edible oils and fats; non-specialized wholesale of food, beverages and tobacco; support activities animal production;



Source: processing based on the National Register of Agricultural Cooperatives

Figure 9. Net profit registered by NACE[1] domains
in the period 2018–2020 (thousand RON)

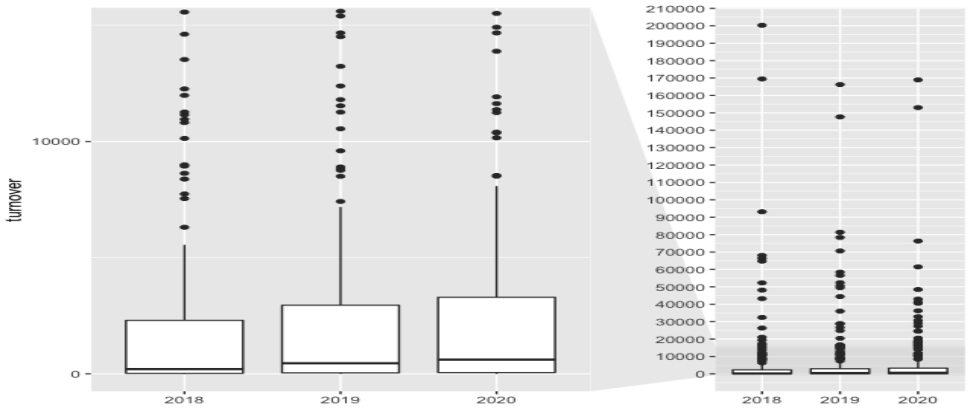
- ✓ the median profit, in 2018, was over 50 thousand RON in: growing grapes; poultry raising; growing other tree and bush fruits and nuts; wholesale of live animals; support activities for animal production;
- ✓ in 2019, 49 cooperatives with activities in growing cereals (except for rice), leguminous crops and oilseeds registered an average profit of 137 thousand RON; average profits over 100 thousand RON were registered in: growing grapes; poultry raising; wholesale trade in fruit and vegetables; non-specialized wholesale of food, beverages and tobacco; wholesale of live animals;
- ✓ the median profit, in 2019, was over 50 thousand RON in the following activities: growing grapes; wholesale of live animals; support activities for crop production; manufacture of prepared feeds for farm animals; storage; growing pome fruits and stone fruits; wholesale of grain, unmanufactured tobacco, seeds and animal feeds;
- ✓ in 2020, 3 cooperatives raising poultry registered average profits of 791 thousand RON; other activities in which the average profit was higher than 100 thousand RON were: growing grapes; wholesale trade of meat

[1] NACE – Statistical Classification of Economic Activities in the European Community, Rev. 2

and meat products; storage; manufacture of grain mill products; processing and preserving fruit and vegetables; wholesale trade in dairy products, eggs, and edible oils and fats; wholesale trade of fruit and vegetables; agents involved in the sale of agricultural raw materials, live animals, textile raw materials and semi-finished goods; growing cereals (except for rice), leguminous crops and oilseeds; non-specialised wholesale of food, beverages and tobacco; growing vegetables and melons, roots and tubers;

- ✓ The median profit for 2020 was over 50 thousand RON in: growing grapes; storage; manufacture of grain mill products; manufacture of oils and fats (Figure 9).

In the next stage, we followed the dynamics of turnover in the case of profitable agricultural cooperatives, for the years 2018–2020 (Figure 10, Figure 11, Figure 12).

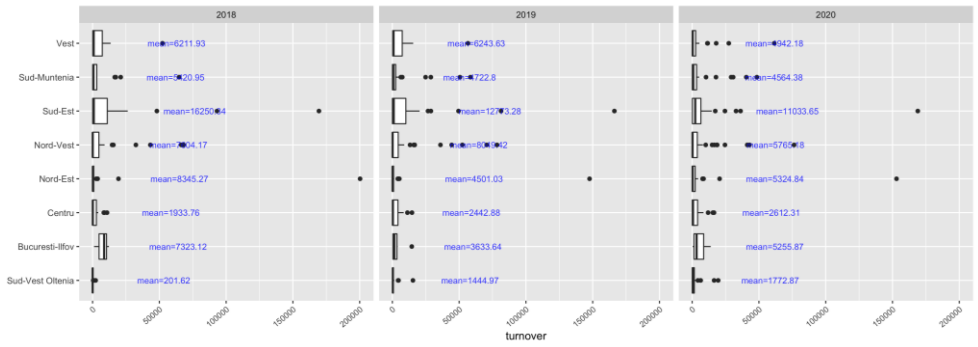


Source: processing based on the National Register of Agricultural Cooperatives

Figure 10. Dynamics of turnover for the years 2018–2020 (thousand RON)

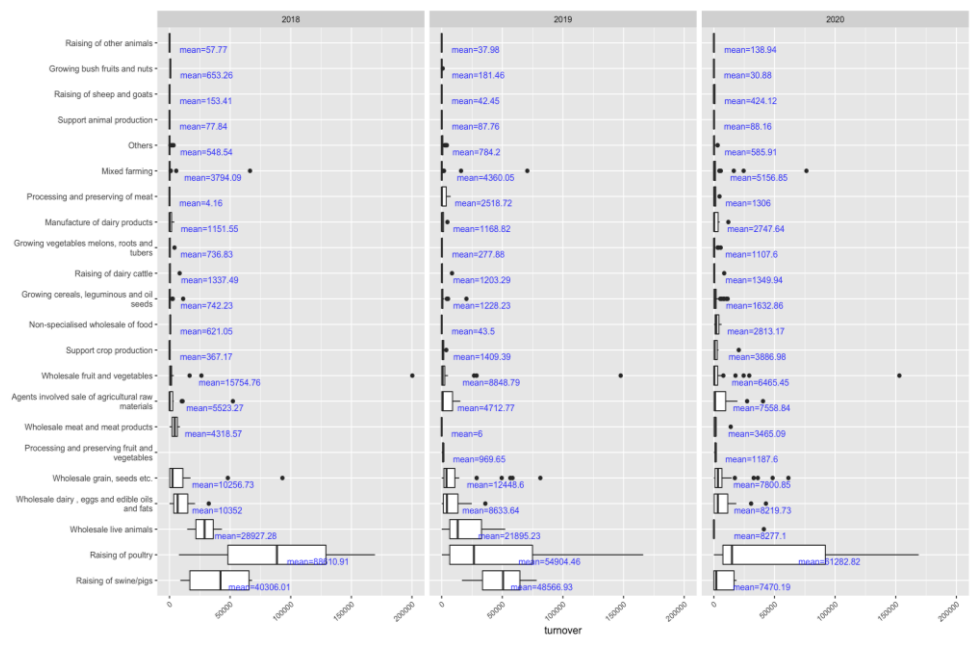
The data extracted from the NRAC showed that:

- in 2018, 182 profitable agricultural cooperatives declared a turnover higher than zero, the total value amounting to 1.2 billion RON; 6.6 million RON was the average turnover;
- in 2019, 240 cooperatives declared a total turnover of 1.4 billion RON; on the other hand, the average turnover decreased to 6 million RON;
- in 2020, 303 cooperatives totalled a turnover of 1.5 billion RON; the average turnover reached 4.9 million RON;
- the values are unevenly distributed, but there is an increase in the median from year to year, although the average values have decreased (Figure 10);
- the regions with the highest average values are Sud-Est and Nord-Vest (Figure 11).



Source: processing based on the National Register of Agricultural Cooperatives

Figure 11. Turnover, by regions, for the years 2018–2020 (thousand RON)



Source: processing based on the National Register of Agricultural Cooperatives

Figure 12. Turnover by NACE domains for the years 2018–2020 (thousand RON)

The economic activities in which turnover had the highest average values were the following (Figure 12):

- in 2018: poultry raising (400 thousand RON); wholesale trade in fruit and vegetables (250 thousand RON); growing other tree and bush fruits, strawberries and nuts (176 thousand RON); support activities for crop production (171 thousand RON); wholesale of live animals (169 thousand RON); wholesale trade of dairy products, eggs, and edible oils and fats (136 thousand RON);

- in 2019: poultry raising (237 thousand RON); wholesale trade in fruit and vegetables (236 thousand RON); growing cereals (except for rice), leguminous crops and oilseeds (136 thousand RON);
- in 2020: poultry raising (791 thousand RON); wholesale trade in meat and meat products (417 thousand RON); processing and preserving fruit and vegetables (237 thousand RON); wholesale trade in fruit and vegetables (147 thousand RON), etc.

Summarizing the data on profitable agricultural cooperatives, with a turnover higher than zero for the period 2018–2020, we can see that most of them operate in (Figure 13):

– growing cereals (except for rice), leguminous crops and oilseeds (57 in 2020);
– wholesale of cereals, seeds, fodder and unprocessed tobacco (45 in 2020);
– wholesale trade in fruit and vegetables (43 in 2020);
– mixed farming (26 in 2020).

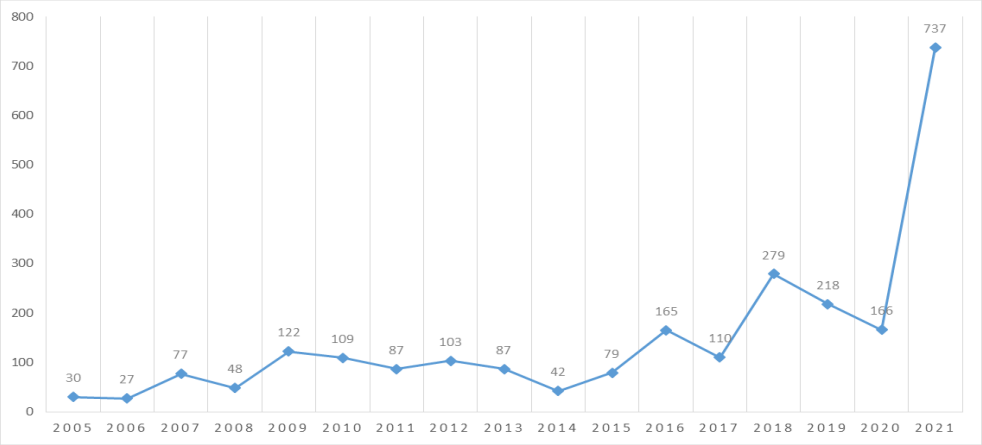
Source: processing based on the National Register of Agricultural Cooperatives

Figure 13. Profitable agricultural cooperatives, by NACE and years

Unfortunately, other indicators such as turnover per employee or net profit/employee cannot be calculated based on NRAC data (at least the September 2021 version), because 36.6% of the profitable agricultural cooperatives did not declare information on the average number of employees. As we mentioned in the methodology part, the database is perfectible, and this is first exploratory research meant to highlight the trends in the system.

Regarding the connection between economic performance and years of operation, we found average drops from year to year, so that while in 2018 the profitable agricultural cooperatives had, on average, 5.8 years, in 2019, 4.69 years, and in 2020, 3.56 years. The conclusion we can draw is that the newly established cooperatives are performing better and better.

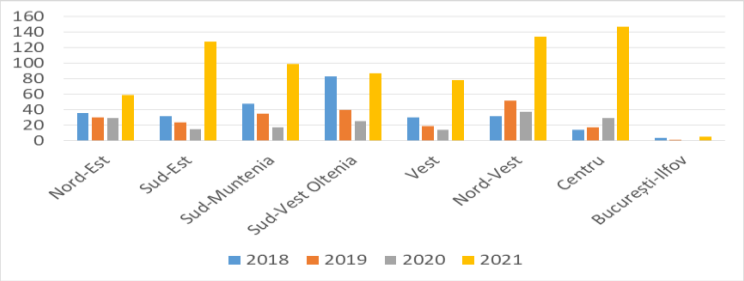
We are certainly witnessing a revival of the cooperative system in Romania, as shown by the data on net profit and turnover, also evidenced by the growing interest of agricultural producers in the advantages of these forms of association. Thus, the figures show a very interesting evolution of the agricultural cooperatives in the National Trade Register Office for 2021. We had 1749 cooperatives registered over 16 years, and 737 cooperatives registered in 2021 (Figure 14). This increase is significant and further evidence that the cooperative system is considered to be more resilient by farmers, especially in times of economic crisis.



Source: processing based on the National Trade Register Office statistics

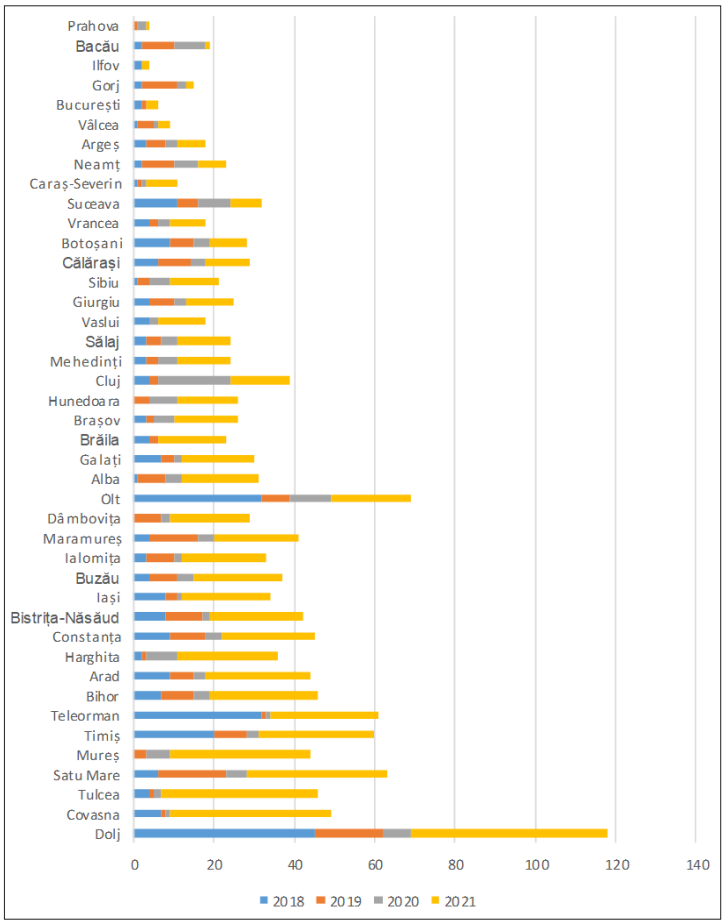
Figure 14. Agricultural cooperatives in Romania – 2005–2021 evolution

By regions, in the period 2018–2021, most agricultural cooperatives were registered in Centru, Nord-Vest and Sud-Est (Figure 15). Two counties stand out, Dolj (118) and Olt (69), which hold the record for matriculation of new agricultural cooperatives (Figure 16).



Source: processing based on the National Trade Register Office statistics

Figure 15. Registrations of agricultural cooperatives
from January 1st 2018 to December 31st 2021, by regions



Source: processing based on the National Trade Register Office statistics

Figure 16. Registrations of agricultural cooperatives by counties (2018–2021)

Data on the sectors and activities in which these agricultural cooperatives were established and how they managed in their first year of activity, we will have after the submission of the balance sheets for the year 2021.

5. CONCLUSIONS

The cooperative system shows clear signs of development. The causes are many: European and national funds that cooperatives can benefit from; international projects aimed at stimulating the establishment of agricultural cooperatives in Romania in recent years: CoopNet, New Crops, AGRICOOP, etc.; Law no. 265/2020 for the amendment and completion of Law no. 566/2004 on agricultural cooperation with provisions regarding: the inclusion of new NACE areas, the extension of the range of activities, the possibility of entering the peasant household as a member, the clear definition of the active agricultural cooperative – turnover and employees at any time during the reference periods, the period of concluding contracts between cooperative and members for at least 3 years, tax facilities, etc.; support from Local Action Groups for the formation of cooperatives, especially in areas with high added value: horticulture, animal husbandry, beekeeping, etc.; experience gained by cooperatives over time; greater transparency regarding the activity of cooperatives; farmers' belief that, through cooperation, they can better position themselves in the value chain, earn better incomes, increase their resilience in the agri-food system and improve the quality of life in rural areas.

As we have presented in this study, several agricultural cooperatives in Romania have proved to be profitable, overall, and their activity was better in 2020, contrary to expectations, showing that they can be resilient in conditions of unforeseen shocks in the agri-food system and not only.

6. ACKNOWLEDGEMENT

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