The socio-economic determinants of small family farms resiliance:
Comparative analysis for the selected Central and Eastern European countries

SEBASTIAN STĘPIEŃ, JAN POLCYN, MICHAŁ BORYCHOWSKI

INTERNATIONAL CONFERENCE ON MANAGEMENT, ECONOMICS AND ACCOUNTING

ALBA IULIA, NOVEMBER 19-20, 2020

Aim of the presentation

To identify the microeconomic factors (variables describing a farm), institutional factors (in terms of farm integration with the market) and factors related to agricultural policy (share of income support), which affect the socio-economic condition of small family farms

The scope of the analysis covers Lithuania, Moldova, Poland, Romania and Serbia. All these countries underwent changes based on political transitions, and today they have similar, fragmented agrarian structures.

Basic info about the agricultural sector (1)

Table 1. Number of farms and utilised agricultural area in the analysed countries

Specification	Poland	Lithuania	Romania	Serbia	Moldova
Total number of farms (thous.)	1,406.0	150.3	3,422.9	569.3	369.7
including smaller than 10 ha of UAA	1,050.0 (75%)	78.8 (52%)	3,225.0 (94%)	501.0 (88%)	239.0 (65%)
Average farm size (ha of UAA)	10.5	19.6	3.9	6.1	6.8
Total utilised agricultural area (thous. ha)	14,539.6	2,947.2	13,413.7	3,486.9	2,496.6
Agricultural land (thous. ha) in farms smaller than 10 ha UAA	4,057 (28%)	430.0 (15%)	4,642 (35%)	2,162 (62%)	323.0 (13%)

Data for: Poland and Moldova – 2017, Lithuania and Romania – 2016, Serbia – 2018.

Basic info about the agricultural sector (2)

Table 2. The number of farms by the economic size (measured by standard output) in the analysed countries

Economic size	Number of farms (thous.) and their share in the total number of farm				
	Poland	Lithuania	Romania	Serbia	Moldova
below EUR 4 thous. of SO*	661 (47%)	75 (50%)	3,200 (94%)	289 (51%)	data not available
EUR 4-15 thous. of SO	437 (31%)	52 (35%)	115 (3%)	213 (37%)	
above EUR 15 thous. of SO	308 (22%)	23 (15%)	108 (3%)	67 (12%)	

Data for: Poland and Moldova – 2017, Lithuania and Romania – 2016, Serbia – 2018.

*SO – Standard Output, the average five-year production of the crop or animal expressed in thousands of euro per one year in the region's average production conditions.

Dataset - surveys

➢ The analysis was based on surveys conducted in Poland in 2018 and in 2019 in the other countries.

➢ The samples numbered 710 farms in Poland, 1000 in Lithuania, 900 in Romania and 550 each in Serbia and Moldova.

➢ Data were collected in the form of direct interviews by agricultural advisors.

➢ Interview questions concerned four areas: general farm features, economic and social sustainability, environmental sustainability and connections with the market.

Dataset – criteria

➢ Poland: up to 20 ha and EUR 25 thous. SO

➢ Lithuania: up to 20 ha and EUR 25 thous. SO

➢ Romania: up to 20 ha and EUR 15 thous. SO

➢ Serbia: up to 20 ha and EUR 15 thous. SO

➢ Moldova: up to 20 ha (no SO data)

Standard Output, the average five-year production of the crop or animal expressed in thousands of euro per one year in the region's average production conditions.

Methods (1)

➢The research process was carried out in two stages.

➢First stage – a synthetic measure of resiliance as a combination of two components – economic and social.

➢CRITIC-TOPSIS method was used in this stage.

➢These dimensions were based on sets of variables that were dictated by the availability of data from questionnaires and based on the literature review.

Table 3. Elements of a synthetic measure of resiliance

Economic variables	Social variables
• Income gap ratio • Subjective assessment of the material situation of a household • Subjective assessment of investment capacity • Estimated value of an agricultural holding	• Household equipment • Usable floor space • Participation of the farm manager and / or adult members of the family in lifelong learning systems • Participation of the farm manager and / or adult family members in cultural and entertainment events • Workload index

Table 4. Results for synthetic socio-economic resiliance index for the analysed countries (value ranges from 0 to 1)

Specification	Poland	Lithuania	Romania	Serbia	Moldova
Average value	0,508	0,476	0,518	0,529	0,416
Max value	0,853	0,670	0,938	0,873	0,717
Min value	0,281	0,247	0,157	0,151	0,110
Standard deviation	0,093	0,083	0,134	0,132	0,111

Methods (2)

Second stage – to show the impact of selected variables on the socio-economic conditio (resiliance) of small family farms multiple regression analysis was used, where:

- Y: socio-economic conditio (resiliance index) of farms
- X_1: index of farm integration with the market
- X_2: value of the agricultural output
- X_3: education of the farm manager
- X_4: age of the farm manager
- X_5: utilised agricultural area of the farm
- X_6: main production type
- X_7 : share of subsidies in the farm income

Asssumptions related to the regression analysis results

The improvement of socio-economic conditio (resiliance) of small family farms is fostered by:

➢ an increase in the value of index of farm integration with the market (X_1);

➢ an increase in the value of agricultural production (X_2);

➢ an increase in the level of education (X_3);

➢ the higher age of the farm manager (X_4);

➢ an increase in the utilised agricultural area in the farm (X_5);

➢ mixed type of production (X_6);

➢ higher share of subsidies in the farm income

Results

Specification	regression coefficient (robust standard error)				
	Poland	Lithuania	Romania	Serbia	Moldova
X1: market integration [ln]	.333***	.021*	-.063	.184***	.115**
X2: agricultural output [ln]	.055***	.036***	.024**	.101***	.047***
X3: education	.054***	-.0002	-.005	.046***	.016*
X4: age [ln]	.056**	-.062***	-.059*	-.006	-.107**
X5: farm area [ln]	.023*	-.022**	.006	-.055***	.036*
X6: production type: crops	-.016	-.079***	-.166***	-.005	-.019
X6: production type: animal	-.041**	.045***	.065**	.075	-.040
X7: share of subsidies in the farm income: below 50%	.043*	.012	.098***	not applicable	not applicable
X7: no public support	not applicable	not applicable	not applicable	.005	-.103***
_cons	-2.491***	-.727***	-.717***	-1.948***	-1.006***

Results (1)

1. Socio-economic condition of farms is significantly influenced by **market integration**. This positive relationship was confirmed in all countries except Romania.

2. The volume of **agricultural output** for each country showed a significant positive impact on resiliance index.

3. The **education** of a farm manager significantly affects the socio-economic position of small family farms in Poland, Serbia and Moldova. There was no significant impact in Lithuania and Romania.

Results (2)

4. The influence of **age** on resiliance is ambiguous. Farmer's age is conducive to achieving higher index in Poland, but negatively affects in Lithuania, Moldova and Romania.

5. The variable **farm area** was significant for all the countries surveyed except Romania, but the direction of the impact was not the same in all the countries. In Poland and Moldova, the signs were positive; in Lithuania and Serbia, negative.

Results (2)

6. In case of **production type**, compared to mixed production, farms with crops had a negative effect on socio-economic condition of farms. This was true in all the countries, but only in Lithuania and Romania was this variable statistically significant. On the other hand, compared to mixed production, animal production had a significant negative impact on the sustainability of farms in Poland, but it was positive in Lithuania and Romania. The type of production did not have a statistically significant impact on the sustainability of farms in Serbia and Moldova.

7. Contrary to the authors' expectations, in Poland and Romania, a lower share of **income support** increased socio-economic index (a positive indicator was recorded for Lithuania and Serbia, but in those cases, the variable was not statistically significant). Only Moldova was characterised by a negative sign at the variable.

Conclusions

➤ The analysis indicates that the universal variable shaping the socio-economic sustainability of small-scale family farms is the scale of production. In all countries, this factor was statistically significant, and it had a positive effect on the result.

➤ To achieve higher benefits, the increase in production should be combined with strengthening the market integration of agricultural producers.

➤ Among the demographic variables, the level of education had a significant and positive effect on sustainability in three countries, Moldova, Poland and Serbia.

Policy recommendations (1)

➢ Accounting for this and the fact that higher support does not necessarily ensure socio-economic sustainability, agricultural policy cannot be a simple transfer to income. Rather, it should be focused on those goals that improve the economic and social conditions of farms. These are tasks that increase value and improve the farmer's position in the supply chain.

➢ Therefore, it is worth continuing or implementing financial support for agricultural producer groups and farmers' organisations.

➢ To encourage the participation of farmers in this type of organization the key is to educate tchem through direct training and courses. Such programs could be organised by agricultural advisory centres, agricultural unions, academic centres, and they could be financed under rural development programs.

Policy recommendations (2)

➢ Another proposed solution is to introduce greater transparency into the contracts between farmers and recipients of the raw material. It might be a good idea to create a standardised contract template (at the national level) that would include elements that protect both parties in the transaction.

➢ To establish fair prices, it is possible to create a national information system (and an EU-wide system for EU members).

➢ Finally, it is recommended to promote short supply chains and direct sales as well as create infrastructure (e.g. local bazaars) for that type of exchange.

Thank you for your attention