Acta Sci. Pol.
Oeconomia 19 (1) 2020, 61–70
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2020.19.1.7

ORIGINAL PAPER

Received: 12.01.2019
Accepted: 02.01.2020

SMALL FARMS IN THE AREA STRUCTURE OF AGRICULTURAL HOLDINGS OF THE EUROPEAN UNION COUNTRIES

Jacek Strojny✉

University of Agriculture in Krakow, Poland

ABSTRACT

In spite of the evolution of the agrarian structure in EU countries (particularly in Western Europe) the problem of small agricultural holdings is still relevant, as this form of farming remains functional. The term 'small farm' has an ambiguous character. Thus, the study is based on relatively the most objective criterion for identification of small holdings – farms covering areas below 5 ha. The study employs the statistical method of vector elimination, which enables separation of subgroups with similar, homogeneous agrarian structures from among the studied set. The typology of the agrarian structure by means of the taxonomic technique demonstrates how diverse EU countries are with regard to their small agricultural holdings: Southern European countries, some Central European countries, and other states lying in the north of Europe. Additionally, the structure of small agricultural holdings is distinct in Denmark and in the Czech Republic.

Key words: small farms, structure of agricultural holdings, EU countries, method of vector elimination
JEL codes: O18, O52, E65, C49, C65

INTRODUCTION

The term 'small farm' is not unequivocal. In Poland, issues related to small farms have continuously marked their presence since the agrarian transformations imposed on rural areas after World War II. In other countries of Central Europe, the problem of small farms basically emerged at the beginning of the 1990s alongside decollectivisation of agriculture and restitution of peasant holdings. Despite the evolution of the agrarian structure, in Western Europe the issue of small farms is still relevant due to the uninterrupted existence of that form of land management [*Structure and dynamics of EU farms...* 2013].

The method of defining small farms which should raise the least controversy seems to be based on agricultural acreage (AA). It seems to be the most transparent aspect of land management and it seems to have the most registry records, but still it may cause controversy, at least when it comes to the necessity to establish the upper farm area limit. It is dynamic due to the changing technical and economic conditions of production and, over time, it can be affected by the agricultural system. For a farm to be qualified as a small farm its AA cannot exceed 5 ha. Upon establishing such a limit, it can be seen that small farms constitute a significant share in the structure of all entities using agricultural land in individual EU states. The category of small farms defined this way in most EU countries falls into two distinct subgroups: farms which in fact are horticultural plots (area below 1 ha) and farms covering areas between 1–5 ha.

Excluding special branches of production, work on a small farm is not, on the whole, the only source of income for its users. There is a relatively high percentage of people employed on farms who combine incomes

Jacek Strojny https://orcid.org/0000-0002-0577-377X
✉rrstrojn@cyf-kr.edu.pl

from a few different sources. From the economic point of view, small farms do not guarantee satisfactory income to their users. In Poland, small farms generally specialise in plant production or combine land cultivation with animal production. Although most land is maintained in relatively good agricultural condition, small farms do not join the ranks of farms where intensive methods of production are applied. Noteworthy is the fact that over half of fallow lands belong to small farms. Small farms shift to ecological methods of production less frequently than larger and economically stronger farms.

In the past, small farms generated numerous social and economic problems for the rural community. Accompanied by economic and organisational changes in the functioning of agriculture, small farms in the whole EU are an increasingly common element of rural landscape which allows people to live in tune with nature, rather than concentrating on mere satisfaction of production commitments. The smallest farms, which either do not produce anything for sale at all or produce only on a minimal scope, tend to be called social farms [Sikorska 2003]. The majority of people living on small farms do not earn their living from agriculture. Some of those farms gain incomes from non-agricultural activities, with non-market and economically unsound entities adopting other economic practices (e.g. subsistence farming).

Although farms which are small and loosely connected with the market prove the weakness of this sector of agriculture, they still play important non-economic roles. In the long run, nowhere in the EU do small farms which are in a poor financial situation stand a good chance to either maintain the foregoing or undertake new profitable agricultural production. Nonetheless, their number does not mean that the problem of small farms can be neglected in agricultural policies *sensu largo*, i.e. both sectoral and territorial policies [Chlebicka et al. 2009]. For that reason estimating the percentage of small farms in the structure of European agriculture is well justified.

The structure of agriculture is evolving in throughout Europe. Rey and Gerbaud [1996] point to three crucial groups of constituents of the industry:

- interdependencies of production factors (capital, land and labour force);
- production goals defining the nature of the relation between agriculture and economy;
- the role of the state in the functioning of agriculture.

The trend of changes in agriculture seems to be shaped by a constant, slow decrease in the number of farms, which results in general changes to the area structure. Change dynamics take many forms, depending on the type of farm. What can be noticed among small farms is an increase in the pace of change dynamics and a gradual disappearance of this form of land management. On the other hand, there is an increase in the percentage of large farms (defined differently in each of the EU states). Nonetheless, the capacity of this growth is limited by the lack of land available for establishing large farms.

The conducted structural analysis is a descriptive study. Its aim is to describe in general terms the area structure of small farms in EU states in the specific period and to find relevant structural analogies. Upon identification of structural similarities, the distinguished clusters were characterised.

PROBLEMS WITH DEFINITION OF SMALL FARMS

Different understanding of the issue of small farms is seen in the subject literature, which provides a wide range of definitions for small farms. Authors use a variety of terms, such as: small-scale farms, peasant holdings, family-run farms, semi-subsistence farms, non-commercial farms, subsistence farms. Researchers also propose different classification standards for small farms, namely: agricultural acreage by the hectare [Zegar 2012], economic size units (ESU) [Michalska 2012], economic size of the holding measured by standard production (SO) [Goraj et al. 2010, Poczta et al. 2012], size of labour force (AWU) in agriculture, nature of market share, number of people employed in production. Inasmuch as much as farms may generally be distinguished as family-run holdings, i.e. relying on work performed by family members, or as enterprises, i.e. relying on hired labour, the subcategory of small farms basically has the feature of family-run holdings.

Referring to the most commonly considered delimitation standards, it may be proposed that small farms have the following characteristics:

- based on the area criterion – agricultural acreage below 5 ha (AA) or, according to some authors, even below 2 ha;
- based on the economic size criterion – standard production between 8,000 and 25,000 PLN; farms with an SO below 8,000 PLN should be classified as very small farms;
- based on the market share criterion – semi-subsistence farms which deliver 50% of their products to the market.

Inasmuch as the premise based on the farm area constitutes a relatively simple classification standard, the other criteria enabling differentiation of farm categories – particularly small farms – are far more complex. Jóźwiak [2006] identifies the smallest farms by their economic power reflected in the gross margin, measured in ESU (ESU = 1,200 EUR). The author proposes that small farms are units with a gross margin below 2 ESU. In the European Union, however, such farms are treated as very small farms.

A less clear-cut identification criterion for small farms has been postulated by Zegar [2007]. The author suggests that small farms are mostly subsistence farms (i.e. farms where over half of production is dedicated for self-supply). Identification of this group of farms does not rely on the farm area, yet in Poland it is a good identifier of small units. Small farms identified in this way have small acreage and derive income from non-agricultural sources. In Poland they occupy 16% of agricultural acreage and employ almost 30% of the labour force in agriculture. Still, for the purposes of comparative studies of different countries, the reasonableness of identifying small farms by the above-mentioned criterion is challenged by dissimilar conditions in other countries. Additionally, the quality of the available statistical data questions the possibility to pivot an international study on that criterion.

The number of agricultural holdings, not only in particular categories (depending on a delimitation base used) but also their overall number, may differ on account of the accepted definition or a source of statistical data. Differences in definitions do not only occur between countries; they are also found within countries, because different national institutions apply different definitions of agricultural holdings for their own individual purposes – and their classifications in particular.

NOTES ON ANALYTICAL APPROACHES TO STRUCTURES IN ECONOMIC STUDIES

The research problem was analysed on the basis of the concept of the economic structure. The notion of the economic structure and its role in economic systems is perceived differently by particular authors. Kirman [1989] concentrates on the schematics of communication and interaction between economic objects. Baranzini and Scazzieri [1986] consider the structure as a network of interactions which underpin the system. Pasinetto [1965, 1981] forms his theory of the economic structure by referring to the concept of objective conditions which determine relations inside the system and its evolution. A prominent place in the literature on economy is occupied by the structural analysis known as Leontief input-mutput model [Leontief 1951], including its extensions suggested by Stone [1956]. Baranzini and Scazzieri [2012] highlight that the structure plays a critical role in evolution of economic systems. The structure, including its changes, is crucial for creation and verification of economic theories. Baranzini et al. [2015] concentrate on the impact of resources on structural change. The authors define the problem of limitation of resources in terms of a bottleneck. The structural approach to the analysis of evolution of regional production systems was employed by Garcia [2006]. Cooper et al. [2007] demonstrate the reasonableness of an approach shift in the regional analysis characterised by definition of regions in the form of overlapping regional structures rather than by identification of regions according to geographical criterion. The work by Basu [1990] is one of only a few examples of the structural approach to the issue of area structure in agriculture and to the impact of interactions within the industry on sector growth.

In the classic approach, structural analysis focuses on the description of a studied phenomenon with regard to the analysed features on the basis of selected statistical indicators (location, changeability, asymmetry). It is common practice to analyse the structure of a particular phenomenon relying on, for instance, concentration indicators [Hirschman 1980].

Westlund and Zackrisson [1986], by indicating the advantages of quantification by means of econometric methods, suggest the possibility to describe evolution

of the economic structure arising out of changes in the economic system. The authors remark that it is a problem too rarely undertaken within the context of the theory. Hendry and Richard [1990] add that the quantitative approach cannot stand in conflict with the theory and results of other studies.

MATERIALS AND RESEARCH METHODS

The research is based on Eurostat data. The statistical data are valid for 2013 and apply to the area structure of agricultural holdings in EU member states. The structure was presented by the number of farms in particular area classes (following Eurostat). For the purposes of the taxonomic analysis, the number of farms was converted into percentages in the area classes. Due to the fact that the data involve one period, the evolution of the phenomenon cannot be followed but its state can be examined.

Subgroups of objects showing structural similarity, whereby the structure of each country is an object, were separated by means of a taxonomic statistical technique – the vector elimination method [Chomątowski and Sokołowski 1978, Kukuła 1996, Bogocz et al. 2010]. The method is applied by dividing a specific set into subgroups of items with similar structures, which enables the analysis of structural diversification. Each of the countries is ascribed with an identical structure (in terms of construction) and comparisons are made using the method of 'each object against another'. What determines the similarity of objects is the level of homogeneity of compared structures. In the process of taxonomic group identification, the following indicator of lack of similarity (P_{ij}) was used:

$$P_{ij} = 1 - \sum_{k=1}^{r} \min\left(p_{ik}, p_{jk}\right) \quad (1)$$

where:
i, j – object number;
p_{ik} – percentage of k-th item in the structure of object I;
p_{jk} – percentage of k-th item in the structure of object j;

Formula (1) yields the value within the range of $< 0, 1>$. For identical structures $P_{ij} = 0$; while for structures which are totally different $P_{ij} = 1$.

Separation of taxonomic groups was carried out on the basis of the threshold value of structure diversification $\alpha \in (0, 1)$. The α indicator was established on the basis of empirical data as the arithmetic mean derived from the appropriate structure diversification matrix. Pairs of objects whose structure diversification is below α fell within the same taxonomic group.

SMALL FARMS IN THE AREA STRUCTURE OF EU COUNTRIES

The number and location of small farms in the agriculture of each EU member state is strictly determined by the shape of the area structure. Table 1 presents information for 2013 on the number of agricultural holdings in EU countries with a breakdown into area categories. Transformation of these quantities into relative indicators constitutes a basis for clustering. Grouping enables identification of shared regularities, and makes it possible to separate clusters of countries with a relatively homogeneous area structure. The taxonomic analysis conducted with vector elimination method on the percentages of farms by area categories specified in Table 1 resulted in identification of three groups of EU countries.

The results of differentiation of the EU member states by their area structure of agricultural holdings are presented in Table 2. The most numerous cluster gathers 13 countries (Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, the Netherlands, Ireland, Luxembourg, Germany, Sweden, the Great Britain), mostly from Western and Northern Europe. This cluster is characterised by a relatively small number of small farms and the highest percentages of farms from the largest area classes (Table 2). The second cluster is made up of 10 countries (Croatia, Greece, Spain, Lithuania, Latvia, Poland, Portugal, Slovakia, Slovenia, Italy). It represents countries whose agricultural structure is dominated by average-sized farms and a considerable percentage of small farms. The third cluster includes five countries: Bulgaria, Cyprus, Malta, Romania and Hungary. Characteristically, it features an extremely high percentage (90.1%) of small farms in the area structure. Particularly numerous is the area class of below 2 ha: it accounts for 73.7% of all agricultural holdings in this cluster.

Table 1. Agricultural holdings in EU countries in 2013 according to area categories (number)

Country	Area category									Total
	0 ha	< 2 ha	2–4 ha	5–9 ha	10–19 ha	20–29 ha	30–49 ha	50–99 ha	> 100 ha	
Austria	280	14 580	27 670	24 430	30 290	16 680	14 660	8 730	2 570	139 890
Belgium	300	1 600	3 460	4 980	6 840	4 930	6 810	6 530	2 190	37 640
Bulgaria	9310	183 640	27 810	10 880	6 780	3 210	3 410	2 960	6 160	254 160
Croatia	200	60 700	48 220	24 690	12 610	3 880	3 030	2 610	1 350	157 300
Cyprus	220	26 310	5 260	1 770	900	310	290	210	110	35 370
Czechia	100	2 700	1 880	4 940	4 610	2 360	2 370	2 460	4 630	26 050
Denmark	510	310	870	7 750	6 870	3 950	4 360	5 380	7 880	37 890
Estonia	430	1 770	4 140	3 970	3 340	1 400	1 180	1 150	1 790	19 190
Finland	90	880	1 900	6 160	10 980	8 190	10 940	10 580	4 610	54 320
France	8 500	51 590	56 280	41 090	44 770	31 610	47 440	93 330	97 600	472 210
Germany	2 870	12 010	9 720	44 580	59 020	28 920	42 530	50 220	35 160	285 030
Great Britain	640	3 360	8 350	26 990	28 810	17 810	23 420	32 470	40 980	182 820
Greece	5 680	358 970	179 470	86 520	45 560	15 080	11 120	5 430	1 450	709 270
Hungary	33 670	334 760	42 550	25 550	20 160	8 350	7 490	6 590	7 640	486 760
Ireland	10	2 530	7 810	16 850	33 420	24 190	30 230	19 740	4 800	139 580
Italy	520	277 910	313 930	172 900	114 850	44 690	39 870	30 180	15 100	1 009 960
Latvia	1 030	17 630	16 150	16 090	15 790	5 320	4 140	2 700	2 890	81 750
Lithuania	70	24 250	67 100	38 440	20 070	6 520	5 560	5 100	4 680	171 800
Luxembourg	0	180	140	190	170	120	210	600	450	2 060
Malta	330	7 600	1 110	250	40	10	0	0	0	9 340
Netherlands	1 690	6 930	9 860	9 400	10 060	6 890	10 980	9 280	2 390	67 480
Poland	6 990	326 140	444 220	308 200	208 990	62 040	40 440	20 570	10 950	1 428 550
Portugal	840	121 860	68 450	31 310	18 360	6 750	6 150	4 660	6 040	264 420
Romania	58 190	2 589 920	691 260	193 870	49 650	10 260	8 470	7 260	13 080	3 621 950
Slovakia	1 500	5 910	6 450	2 860	2 220	770	730	790	2 310	23 550
Slovenia	100	18 360	24 810	17 260	8 190	2 050	1 070	420	110	72 380
Spain	4 560	253 410	232 440	140 780	110 800	51 550	53 550	49 960	51 820	948 870
Sweden	90	710	6 410	15 770	13 610	6 650	7 220	8 160	8 030	66 640

Source: Author's study based on Eurostat 2018 data.

Table 2. Taxonomic groups according to area structure of agricultural holdings in EU countries

Area category	Taxonomic group obtained by the vector elimination method						Total ($N = 28$)	
	Cluster 1 ($N = 13$)		Cluster 2 ($N = 10$)		Cluster 3 ($N = 5$)			
	$\bar{x}$ (%)	$V(x)$ (%)	$\bar{x}$ (%)	$V(x)$ (%)	$\bar{x}$ (%)	$V(x)$ (%)	$\bar{x}$ (%)	$V(x)$ (%)
0 ha	0.8	103.9	1.0	190.3	3.3	73.8	1.3	136.2
< 2 ha	5.8	72.0	29.9	38.6	73.7	6.5	26.5	98.2
2–4 ha	9.2	67.0	28.9	19.0	13.1	30.6	17.0	62.9
5–9 ha	15.4	30.1	17.1	26.4	4.5	24.6	14.1	43.6
10–19 ha	17.4	25.9	11.1	34.6	2.2	63.1	12.5	54.7
20–29 ha	10.5	30.8	3.8	37.4	0.9	78.8	6.4	73.1
30–49 ha	13.3	35.0	3.1	45.6	0.8	84.9	7.4	87.2
50–99 ha	15.2	40.9	2.4	59.4	0.7	89.2	8.0	99.8
> 100 ha	12.3	61.8	2.7	109.4	0.9	110.3	6.9	109.1

Cluster 1 – Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, the Netherlands, Ireland, Luxembourg, Germany, Sweden, Great Britain; Cluster 2 – Croatia, Greece, Spain, Latvia, Lithuania, Poland, Portugal, Slovakia, Slovenia, Italy; Cluster 3 – Bulgaria, Cyprus, Malta, Romania, Hungary.

Source: Author's study based on Eurostat 2018 data.

The diversity of criteria used as a basis for identification of small farms directly leads to the lack of homogeneity in identification results and, consequently, different quantification. A plethora of authors, including Ascione et al. [2012] as well as Alexandri and Luca [2012], point to the farm area and the economic size unit as the most common identification criteria for small farms.

This study relies on agricultural acreage as the classification criterion. It has been assumed that small farms involve entities whose agricultural acreage does not exceed 5 ha. The information compiled in Table 1 (number of farms in area classes), besides presenting the features of the general agricultural structure, displays the rank of small farms. Based on the area criterion, this information presents the number of small farms against other area categories in individual member states. Depending on the accepted delimitation criterion, small farms constituted the majority group in the total number of agricultural holdings in 2013, i.e. 66.2%. Altogether, in all EU member states there were 7.152 M small farms, against the total number of farms at 10.806 M. The highest number of agricultural holdings in the EU was recorded in Romania (3.621 M) and Poland (1.428 M), making 33.5% and 13.2% of the total number of agricultural holdings in the EU, respectively. There were also a lot of small farms in Italy (9.3%), Spain (8.8%) and Greece (6.6%) compared to the total number of agricultural holdings in EU countries.

The high absolute number of farms, to some extent, corresponds with the area of each country; however, it is difficult to establish the unambiguous nature of interdependencies between EU states. Its complex nature is showcased even more by the area structures of agricultural holdings when considering the percentage of small farms. On average, small farms (up to 5 ha) account for 44.8% of all farms in EU countries. However, the standard deviation of that indicator is at the level of 30.8%. Based on the statistical criterion (mean average ± standard deviation), four groups of EU countries may be separated, according to the percentage of small farms in their area structure (quantitative criterion):

1. Countries where small farms account for up to 11% of all farms: Denmark (4.5%), Finland (5.3%), the Great Britain (6.8%), Ireland (7.4%), Germany (8.6%), Sweden (10.8%).
2. Countries where the number of small farms is within the range of 14–43%: Belgium (14.2%), Luxembourg (15.5%), the Czech Republic (18.0%), France (24.6%), the Netherlands (27.4%), Austria (30.4%), Estonia (33.0%) and Latvia (42.6%).
3. Countries where the ratio of small farms is between 51 and 73%: Spain (51.7%), Lithuania (53.2%), Poland (54.4%), Italy (58.7%), Slovakia (58.9%), Slovenia (59.8%), Croatia (69.4%) and Portugal (72.3%).
4. Countries where small farms constitute over 76% of all farms: Greece (76.7%), Hungary (84.4%), Bulgaria (86.9%), Cyprus (89.9%), Romania (92.2%) and Malta (96.8%).

The first of the specified sub-sets includes mostly countries from Northern Europe and is characterised by a marginal percentage of small farms. On the other end of the spectrum, the (fourth) group with the highest percentage of small farms in the agrarian structure is composed of countries from Southern and Central Europe. Generally, on the basis of the above-mentioned differentiation, it can be concluded that Western EU member states situated in the north of the continent, and the Baltic states, feature a below-average percentage of small farms. On the other hand, the new member states (from Central Europe) and the member states lying in Southern Europe have an above-average percentage of small farms in the EU.

Table 1 presents a detailed agrarian structure of the member states. Overall insight into the role of small farms in the area structure of EU countries has been gained thanks to the grouping conducted with the method of vector elimination, the results of which are shown in Table 3. The agrarian structure taxonomy presented therein is based on the juxtaposition of small farm class percentages with the cumulated percentage of other area classes. Such an analysis results in identification of three clusters with the following features:

1. The first cluster gathers countries with domination of agricultural holdings of over 5 ha in area (the mean average for the cluster equals 82.2%, against the mean average for all the countries at 55.2%). It comprises: Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, the Netherlands, Ireland, Luxembourg, Latvia, Germany, Sweden and the Great Britain. The ratio of classes below 5 ha decreases together with the farm area.
2. The second cluster is represented by countries dominated by small farms (below 5 ha), which on average account for 61.7% against the average for the whole population at 44.8%. This cluster includes: Croatia, Greece, Spain, Lithuania, Poland, Portugal, Slovakia, Slovenia and Italy.

Table 3. Small holdings in the structure of agricultural holdings in EU countries

Area category	Taxonomic group obtained by the vector elimination method						Total ($N = 28$)	
	1 ($N = 14$)		2 ($N = 9$)		3 ($N = 5$)			
	$\bar{x}$ (%)	$V(x)$ (%)	$\bar{x}$ (%)	$V(x)$ (%)	$\bar{x}$ (%)	$V(x)$ (%)	$\bar{x}$ (%)	$V(x)$ (%)
0 ha	0.9	0.8	1.0	2.0	3.3	2.4	1.3	1.8
< 2 ha	6.9	5.8	30.8	11.8	73.7	4.8	26.5	26.0
2–4 ha	10.0	6.6	29.9	4.7	13.1	4.0	17.0	10.7
> 5 ha	82.2	12.0	38.3	9.0	10.0	4.8	55.2	30.8

1 – Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, the Netherlands, Ireland, Luxembourg, Latvia, Germany, Sweden, Great Britain; 2 – Croatia, Greece, Spain, Lithuania, Poland, Portugal, Slovakia, Slovenia, Italy; 3 – Bulgaria, Cyprus, Malta, Romania, Hungary.

Source: Author's study based on Eurostat 2018 data.

3. The third cluster is made up of countries where the ratio of small farms is 90%. Here there are: Bulgaria, Cyprus, Malta, Romania and Hungary. Diversification in this cluster is negligible.

The distinguished sub-groups are relatively homogeneous – their internal diversification expressed with the coefficient of variation is low.

The vector elimination method also allowed for identification of regularities in the structure of small farms in particular countries (excluding other area classes). Such a study was conducted on the sub-set of small farms separated from the agrarian structure. The results of the typology of the structure of small farms are presented in Table 4. Thus, the following types of small farms can be distinguished in EU countries:

1. In the countries, such as: Austria, Belgium, Croatia, France, Spain, the Netherlands, Luxembourg, Latvia, Germany, Poland, Slovakia, Slovenia and Italy, the ratio of 'up to 2 ha' and '2–4 ha' area classes is almost evenly distributed and totals over 96%.
2. The second seven-item cluster is dominated by an 'up to 2 ha' area class (average at 77.0%). The group includes: Bulgaria, Cyprus, Greece, Malta, Portugal, Romania and Hungary.
3. Taxonomic group of six countries, i.e.: Estonia, Finland, Ireland, Lithuania, Sweden and the Great Britain, is distinguished by the prevalence of small farms of over 2 ha (average at 72.8%).
4. The typological group comprising only the Czech Republic features 57.7% of 'up to 2 ha' farms and 40.2% of farms of over 2 ha in area.
5. A specific structure exists in Denmark: it is distinguished by 30.2% of small farms marked in Eurostat classification as '0 ha' area class.

Except Denmark (group 5), in individual clusters the ratio of the class defined by Eurostat as '0 ha' oscillates between 2 and 4%. Diversification of all of the identified sub-groups of small farms is marginal, which proves homogeneity of the clusters identified.

SUMMARY

On the basis of the data for farm area structure in EU states, three diversified groups of EU states were distinguished. The groupings show a significant difference in the area structures of Northern Europe (large farms) and Southern and Central Europe (dominance of average-sized farms and a considerable percentage of small farms). The role of small farms in the structure of agricultural holdings in EU states was clarified. Three homogenous clusters of countries were identified: countries where farms of over 5 ha dominate (on average 82.2%); countries with a high ratio of small farms (on average 61.7%); and countries with the prevalence of small farms (on average 90.0%).

Table 4. Structure of small agricultural holdings in EU countries

Area category	Taxonomic group obtained by the vector elimination method										Total (N = 28)	
	1 (N = 13)		2 (N = 7)		3 (N = 6)		4 (N = 1)		5 (N = 1)			
	$\bar{x}$ (%)	$V(x)$ (%)	$\bar{x}$ (%)	$V(x)$ (%)	$\bar{x}$ (%)	$V(x)$ (%)	$\bar{x}$ (%)	$V(x)$ (%)	$\bar{x}$ (%)	$V(x)$ (%)	$\bar{x}$ (%)	$V(x)$ (%)
0 ha	3.9	4.4	2.9	2.8	2.8	2.8	2.1	–	30.2	–	4.3	6.2
< 2 ha	44.8	7.9	77.0	8.6	24.4	7.4	57.7	–	18.3	–	48.0	20.9
2–4 ha	51.3	8.0	20.2	10.3	72.8	8.9	40.2	–	51.5	–	47.7	20.3

1 – Austria, Belgium, Croatia, France, Spain, the Netherlands, Luxembourg, Latvia, Germany, Poland, Slovakia, Slovenia, Italy; 2 – Bulgaria, Cyprus, Greece, Malta, Portugal, Romania, Hungary; 3 – Estonia, Finland, Ireland, Lithuania, Sweden, Great Britain; 4 – the Czech Republic; 5 – Denmark.

Source: Author's study based on Eurostat 2018 data.

The typology of the structure of small farms in EU countries resulted in identification of five subgroups, two of which were represented by single objects: Denmark and the Czech Republic. The differentiation of the three most numerous clusters was based on differences in the percentages of 'up to 2 ha' and '2–4 ha' area classes.

REFERENCES

Alexandri, C., Luca, L. (2012). The role of small farms in Romania and their future in the face of challenges of the CAP post 2013. Problemy Drobnych Gospodarstw Rolnych, 1, 13–30.

Ascione, E., Henke, R., Vanni, F. (2012). Small farms in Italy: public support, diversification and economic sustainability. Problemy Drobnych Gospodarstw Rolnych, 1, 31–42.

Baranzini, M., Rotondi, C., Scazzieri, R. (2015). Resources, Production and Structural Dynamics. Cambridge University Press, Cambridge.

Baranzini, M., Scazzieri, R. (1986). Foundations of Economics: Structures of Inquiry and Economic Theory. Blackwell, New York.

Baranzini, M., Scazzieri, R. (2012). The Economic Theory of Structure and Change. Cambridge University Press, Cambridge.

Basu, K. (1990). Agrarian Structure and Economic Underdevelopment. Harwood Academic Publishers, Chur.

Bogocz, D., Bożek, J., Kukuła, K., Strojny, J. (2010). Statystyczne studium struktury agrarnej w Polsce. Wydawnictwo Naukowe PWN, Warszawa.

Chlebicka A., Falkowski, J., Wołek, T. (2009). Małe gospodarstwa w Polsce – charakterystyka. FAPA, Warszawa.

Chomątowski, S., Sokołowski, A. (1978). Taksonomia struktur. Przegląd Statystyczny, 2, 217–225.

Cooper, R., Donaghy, K., Hewings, G. (Eds.) (2007). Globalization and Regional Economic Modelling. Springer, Berlin–Heidelberg.

Garcia, M.S. (2006). Social Capital, Networks and Economic Development: An Analysis of Regional Productive systems. Edward Elgar Publishing, Cheltenham.

Goraj, L., Cholewa, I., Osuch, D., Płonka, R. (2010). Analiza skutków zmian we Wspólnotowej Typologii Gospodarstw Rolnych. Polski FADN, Warszawa.

Hendry, D.F., Richard, J.F. (1990). Recent Developments in the Theory of Encompassing. [In:] B. Cornet, H. Tulkcns (Eds.), Contributions to Operations Research and Econometrics. The Twentieth Anniversary of CORE. MIT Press, Cambridge.

Hirschman, A.O. (1980). National Power and the Structure of Foreign Trade. University of California Press, Los Angeles.

Józwiak, W. (2006). Funkcjonowanie i role społeczne najmniejszych gospodarstw rolnych, Wieś i Rolnictwo, 2, 29–40.

Kirman, A. (1989). The Intrinsic Limits of Modern Economic Theory: The Emperor Has No Clothes. Economic Journal, 99, 126–139.

Kukuła, K. (1996). Statystyczne metody analizy struktur ekonomicznych. Wydawnictwa Edukacyjne, Kraków.

Leontief, W. (1951). The Structure of the American Economy, 1919–1939: An Empirical Application of Equilibrium Analysis. Oxford University Press, New York.

Michalska, S. (2012). Społeczny wymiar funkcjonowania drobnych gospodarstw rolnych. Problemy Drobnych Gospodarstw Rolnych, 1, 85–94.

Pasinetti, L.L. (1965). Causalità e interdipendenza nell'analisi econometrica e nella teoria economica. [In:] Annuario dell'Universitŕ Cattolica del Sacro Cuore – Anno Accademico 1964–65, Il Mulino, Bologna, 233–250.

Pasinetti, L.L. (1981). Structural Change and Economic Growth: A theoretical essay on the dynamics of the wealth of nations. Cambridge University Press, Cambridge.

Poczta, W., Czubak, W., Kiryluk-Dryjska, E., Sadowski, A., Siemiński, P. (2012). Koncepcja ukierunkowania wsparcia gospodarstw rolnych w perspektywie 2014–2020. Ekspertyza dla MRiRW w Warszawie, Poznań.

Rey, V., Gerbaud, F. (1996). Les nouvelles campagnes d'Europe centre-orientale. CNRS Editions, Paris.

Sikorska, A. (2003). Gospodarstwa socjalne w strukturze społeczno-ekonomicznej wsi. IERiGŻ, Warszawa.

Stone, R. (1954). Linear Expenditure System and Demand Analysis: An Application to the Pattern of British Demand. The Economic Journal, 255, 511–527.

Structure and dynamics of EU farms: changes, trends and policy relevance (2013). EU Agricultural Economics Briefs, 9. Retrieved from http://ec.europa.eu/agriculture/rural-area-economics/briefs/pdf/09_en.pdf [accessed 26.10.2019].

Westlund, A., Zackrisson, U. (1986). On the prediction of structurally varying systems. Technological Forecasting and Social Change, 30 (1), 63–72.

Zegar, J. (2007). Kwestia gospodarstw samozaopatrzeniowych w Polsce. Wieś i Rolnictwo, 1, 33–37.

Zegar, J. (2012). Rola drobnych gospodarstw rolnych w procesie społecznie zrównoważonego rozwoju obszarów wiejskich. Problemy Drobnych Gospodarstw Rolnych, 1, 129–148.

Strojny, J. (2020). Small farms in the area structure of agricultural holdings of the European Union countries. Acta Sci. Pol. Oeconomia 19 (1), 61–70, DOI: 10.22630/ASPE.2020.19.1.7

DROBNE GOSPODARSTWA ROLNE W STRUKTURZE OBSZAROWEJ GOSPODARSTW KRAJÓW UNII EUROPEJSKIEJ

STRESZCZENIE

Mimo ewolucji struktury agrarnej w krajach Europy (szczególnie zachodniej) problematyka drobnych gospodarstw pozostaje aktualna w związku z funkcjonowaniem tej formy gospodarowania. Określenie „drobne gospodarstwo rolne" nie jest jednoznaczne. Z tego względu badanie oparto na relatywnie najbardziej obiektywnym kryterium wyodrębniania gospodarstw drobnych – według powierzchni (poniżej 5 ha). Badanie wykorzystuje technikę statystyczną nazywaną metodą eliminacji wektorów. Umożliwia ona wyodrębnienie spośród rozważanej zbiorowości podgrup o podobnych strukturach obszarowych. Typologia struktury obszarowej techniką taksonomiczną ukazuje zróżnicowanie krajów UE ze względu na specyfikę gospodarstw drobnych: krajów Europy Południowej, wybranych krajów Europy Środkowej oraz pozostałych państw (leżących na północy kontynentu). Dodatkowo odrębny charakter ma struktura gospodarstw drobnych w Danii i Czechach.

Słowa kluczowe: drobne gospodarstwa rolne, struktura gospodarstw rolnych, kraje UE, metoda eliminacji wektorów