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Review Article

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REGIONAL ASPECTS OF FAMILY HOLDINGS STRUCTURE IN THE REPUBLIC OF SERBIA[1]

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Abstract

Considering the importance of the size of the land property in regard to the development of agriculture and its effectiveness, the ownership structure, its interdependence with the available labour force (the number of persons and annual work units) and economic size of family holdings, are analysed in the present study. Given that the territory of the Republic of Serbia is very heterogeneous in terms of the achieved level of economic development of certain regions, as well as available resources for the development of agriculture, the structural characteristics are analysed in following four statistical regions: Vojvodina, Belgrade, Šumadija *and Western Serbia, Eastern and Southern Serbia. Key indicators of family holding structure in Serbia are compared with the average for the EU-27. The aim of the present paper is to review the basic aspects of structural characteristics of family holdings, based primarily on the size of holdings/holdings, available labour force, economic size, as well as their regional diversity in 2012, according to Agricultural Census.*

Key words: *family holding, region, ownership structure, economic size, labour.*

JEL: *Q12, Q15, R23*

Introduction

Republic of Serbia, according to the 2012 Census of Agriculture, has 631,552 holdings. The predominant number 628,552 or 99.5% are family holdings that are the most important organizational entities in agriculture of Serbia and hold in their possession about 2.8 million hectares, or 84% of the total utilized agricultural area.

They are characterized by the relatively small size of the land property and large number of separate parts and parcels (Božić et al., 2004). Households with less than 2 hectares make

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up about 48% of the total number of family holdings and have 9.3% of total agricultural land used. The largest holdings, with over 100 ha of land, account for only 0.2% of the total number of family holdings but they dispose with 8.1% of the total agricultural area used.

Ownership structure of holdings is one of the deciding factors regarding the efficiency of agriculture. Agriculture of Serbia is traditionally characterized by unfavourable ownership structure, which is typical for family holdings, which, as the most numerous entities in agriculture, have a dominant impact on its overall development (Bogdanov and Božić, 2005). Given the crucial importance of the ownership structure on operating efficiency in agriculture, it can be concluded that in conditions of unfavourable ownership structure it will be difficult to be competitive at the international market and market of highly developed countries, in the conditions of increasing competition. The process of integration into the World Trade Organization and the European Union (EU), in addition to opening new large markets, requires a significant increase in productivity and competitiveness. In this regard, market liberalization occurs as a major driver of innovation and increase of competitiveness (Bogdanov et al., 2004). Hence, the possibility of family holdings to survive in the future, especially with the entry into the EU, is directly linked to their ability to make the best possible use of available resources.

Given the importance of the size of the land property of family holdings for overall agricultural development, as well as the fact that the Republic of Serbia territorially is very heterogeneous in terms of economic development of certain regions, the paper was based on the hypothesis that family holdings in Serbia are characterized by adverse ownership structure, small size of the property and large number of separate lots and parcels, with significant differences between the regions. In addition, it was presumed that this ownership structure, as well as available labour force on family farms determine their economic size, which is significantly lower than the average in the EU-27, as well as most of its members (indicators for countries in the region were especially analysed, our most significant competitors in the international market of agricultural products). The results obtained are presented at the level of Serbia and four regions (Vojvodina, Belgrade, Šumadija and Western Serbia and Eastern and Southern Serbia) because the data for the region of Kosovo and Metohija is not available. The aim of the present paper is to review the basic aspects of family holdings structural, based primarily on the size of holdings, available labour force, economic size, as well as their regional diversity.

Data sources and methods

For the analysis of structural characteristics on the family holdings of the Republic of Serbia, the data of the Statistical Office of the Republic of Serbia – 2012 Census of Agriculture was used. The analysis was performed for the individual regions[4]. The Law on Regional

4 *Region* is a statistical functional territorial unit, consisting of one or more areas, established for the planning and implementation of regional development policy, in accordance with the nomenclature of territorial units for statistics (NUTS) level 2, not an administrative territorial unit and has no legal subjectivity, *Law on Regional Development*, Official Gazette of RS, no. 51/09.

Development[5] in Serbia has introduced NUTS (the nomenclature of territorial units for statistics) classification of the five regions at the level of NUTS III: the region of Vojvodina, Belgrade region, the region of Šumadija and Western Serbia, the region of Southern and Eastern Serbia and the region of Kosovo and Metohija.

Since one of the main characteristics of family holdings in Serbia is unfavourable ownership structure, i.e. dominant share of small holdings, in the present paper, the regional analysis was conducted of their labour force, and the economic size of family holdings, depending on the size of the property.

In Serbia, for the first time, the results of the 2012 Census of Agriculture showed basic information about the economic size of agricultural holdings according to the methodology applied in EU countries. According to the EC methodology for the typology of holdings (Regulation EC No 1242/2008; Typology handbook EC, RI/CC 1500, Brussels, 25.07.2008), with which the appropriate methodology of the Statistical office of the Republic of Serbia is aligned, the economic size of the farm represents the total value of the standard output (abbreviated SO) or the results of the farm/holding, i.e. the monetary value of gross agricultural production, which the farmer can expect to potentially gain from his land (crops/perennial crops/livestock) in a given region and the «normal» production circumstances. The value of the total SO in the holding is expressed in Euro and represents the sum of the individual SO of all agricultural products (characteristics) that are produced on the farm. Individual SOs obtained by multiplying the SO coefficient per unit for each product type (type of crop/perennial crops, livestock species) and a number of these units (hectares/livestock) on the farm. For Serbia, Statistical Office calculated the coefficient of SO 2007 for the reference period 2005-2009 (Paraušić and Cvijanović, 2014).

The analysis of labour of family holdings is quite complex since the engaged labour force is unevenly distributed throughout the year, and it is difficult to determine the number of working hours of household members (who do not receive a salary, but also participate in the distribution of profit), and the number of hours of work of seasonal labour force on the farm. Due to the specificity of agricultural production and pronounced seasonality, a large number of workers is engaged for a relatively short time, as seasonal workers, who often are not officially reported to the local authorities, which is why there is no possibility of the reliable recording of such labour force. The analysis is further complicated by different methodological approaches to the definition of the labour force starting from: number of employees, number of work days or hours or annual work units. The annual work unit (AWU) is a measuring unit that represents the amount of human labour spent on agricultural activities in the holding. This unit is equivalent to the work of one person, i.e. full-time in one year, eight hours a day, 225 working days. Total manpower in the holding includes: household members (holders of estates and family members), all full-time workers on the farm, seasonal workers and labour engaged on contract, and is expressed in annual work units.

5 *Law on Amendments to the Law on Regional Development*, Official Gazette of RS, no. 30/10.

For the analysis of indicators of farm structure relating to the EU-27 members, data of the EC EUROSTAT statistical base were used (the Agriculture Census in 2010). The usual mathematical-statistical indicators (data structures, indexes level) were used in the present paper for the analysis of ownership structure, economic size, labour of family holdings, labour productivity in Serbia, depending on the size of the property. As for labour productivity Lerman et al. (2002) suggest that, in the absence of data on total factor productivity, a partial measure of productivity should be used, calculated as the ratio of agricultural output to agricultural labour (Juvančič, 2007). The above method of calculating the productivity of labour on family holdings in Serbia was used in this study.

The method of comparison was used to determine the regional differences of indicators of family holding structure between the mentioned regions in Serbia. The comparative method was used to compare the individual indicators of farm holding structure in Serbia (ownership structure, economic size of holding, available labour, achieved labour productivity) and the average for the EU-27 countries, and especially for individual EU member countries from our region (Bulgaria, Romania, Hungary, Greece and Slovenia).

Regional analysis of the ownership structure of family holdings in Serbia

The most of family holdings, relative to their total number which amounts to 628,552 in the Republic of Serbia, are in the region Šumadija and Western Serbia (42%), followed by the Southern and Eastern Serbia (with around 30% of households), while in the region of Vojvodina there is about 23% of family holdings. The least of the family holdings are located in the Belgrade region, about 5%.

The largest part of the total utilized agricultural area (UAA) in Serbia, which amounts to 2,825,068 ha, is owned by holdings in the region of Vojvodina (47%), followed by the region Šumadija and Western Serbia (29.5%), the region Southern and Eastern Serbia (about 20%) and the Belgrade region, where family holdings have about 4% of total utilized agricultural area.

The ownership structure of family holdings in Serbia is unfavourable, with a dominant share of small holdings, up to 2 ha, which account for 48% of their total number (Table 1). When observed by regions, the smallest family holdings account for more than half of total holdings in all regions, except Šumadija and Western Serbia (44%). The highest share of small holdings, with up to 2 ha of land, in the total number of holdings is in the Belgrade region (54.5%). The holdings of size 2 to 5 ha account for 29.4% of the total number of holdings. Their participation is the highest in the region of Šumadija and Western Serbia (around 33%) and the lowest in the region of Vojvodina (19.5%). It can be noted that the small holdings, with less than 5 ha make 77.5% of the total number of holdings in Serbia, and hold in their possession about 21% of agricultural land used. Small size land property of family holdings in Serbia, fragmented into a number of separate parts, does not provide the elementary preconditions for strengthening the overall competitiveness of agriculture (Božić et al., 2006).

Broken down by individual regions, family holdings under 5 ha are the most represented in the Belgrade region, about 84% (which hold about 43% of the UAA region), followed by the region of Southern and Eastern Serbia, with about 82%, disposing with 47 % of utilized agricultural area.

Table 1. Agricultural family holdings (FH) in Serbia by utilized agricultural area (UAA), according to the Agriculture Census in 2012 (in %)

UAA	Serbia-total		Belgrade Region		Vojvodina Region		Šumadija and Western Serbia Region		Southern and Eastern Serbia Region	
	FH number	UAA (ha)	FH number	UAA (ha)	FH number	UAA (ha)	FH number	UAA (ha)	FH number	UAA (ha)
≥0≤ 2 ha	48.1	9.3	54.5	14.2	50.2	4.0	44.1	11.7	50.9	15.3
>2≤5ha	29.4	21.0	29.4	29.2	19.5	7.8	33.4	30.1	31.6	31.4
>5≤10 ha	14.3	21.9	117	24.9	12.9	11.3	16.5	31.3	12.9	27.3
>10≤30ha	6.4	22.0	4.1	19.4	11.0	22.9	5.7	22.9	4.2	19.1
>30≤50 ha	0.8	7.1	0.1	4.2	2.8	13.1	0.2	2.4	0.3	3.2
>50≤100 ha	0.7	10.6	0.1	2.9	2.6	23.1	0.1	1.2	0.1	2.2
> 100 ha	0.2	8.0	0.1	5.2	0.9	17.8	0.0	0.3	0.0	1.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Authors' calculation according to Agriculture Census - 2012, SORS, Belgrade, 2014.

Only 8.1% of holdings in Serbia own more than 10 ha of land property, which use 47.7% of the enumerated UAA. The largest holdings, with more than 50 ha land property, make up only 0.9% of the total number of family holdings in Serbia, and have about 19% of utilized agricultural area. Although there is no comparability with previous census data, it can be concluded that in Serbia, a process of concentration of holdings by size of property is taking place, which is most pronounced in the region of Vojvodina. Changes in the direction of enlarging of land holdings are particularly intense in the group of holdings over 20.00 ha (Todorović, 2014). With the increase in the size of the property comes the change in the structure of production, increase in the degree of utilization of living labour of household members, increase in the degree of utilization of their own machinery, reduction of the total fixed costs per ha and work hour, and all this leads to an increase in income of the family farm (Munćan et al., 2008).

The region of Vojvodina is characterized by the lowest share of small holdings (up to 5 ha) in the total land used (11.8%), and on the other side it has the majority of large holdings, particularly those over 50 ha, which account for about 3.5% of total number of family holdings and hold about 41% of utilized agricultural area. In other regions, the presence of the largest holdings is significantly lower, in the Belgrade region it is only 0.2% of family holdings (with about 8% of the UAA). In the region of Šumadija and Western Serbia largest holdings account for only 0.1% and dispose with 1.5% of UAL, and in the region of Southern and Eastern Serbia - 0.1% holding only 3.7% of utilized agricultural area.

Compared with the average for the EU-27 countries, the family holdings in Serbia have unfavourable ownership structure (Table 2). In Serbia, there is a greater share of smaller-sized holdings/land properties, those up to 10 ha account for 91.8% of family households, and use about 52% of the UAA, and in countries of EU-27, holdings of this size account for 36.2%, and dispose with only 12% of UAA. In contrast, the largest family holdings, with an area of over 100 ha, in Serbia account for only 0.2% of the total number of holdings, and hold only 8% of utilized agricultural area, while in the EU-27 such holdings account for 2.7% of the total number of holdings, and hold 50.9% of UAA. The farm structure in the NMS of CEE today is characterised by a large number of small scale farms and a small number of large farms. Middle-sized market oriented farms are still less developed in comparison to the EU15 (Davidova and Fredriksson, 2007). Agriculture in majority of CEE countries remains characterised by highly dualistic operational structure (small number of farms produces most of agricultural output), (Juvančič, 2007; Lerman, 2001).

Table 2. Agricultural family holdings (FH) in Serbia by utilized agricultural area, according to the Agriculture Census in 2012 and EU-27 (2010), (in %)

Indicators	Family Holdings by UAA (ha)							
	0-2	2-5	5-10	10-30	30-50	50-100	> 100	Total
Serbia								
Number of FH	48.1	29.4	14.3	6.4	0.8	0.7	0.2	100
UAA (ha)	9.3	21.0	21.9	22.0	7.1	10.6	8.0	100
EU-27								
No of farms	5.2	20.1	10.9	10.6	3.3	3.3	2.7	100
UAA (ha)	2.4	4.4	5.2	12.6	8.8	15,7	50.9	100
Bulgaria								
No of Farms	83.1	8.2	2.9	2.6	0.8	0.8	1.5	100
UAA (ha)	3.2	2.0	1.6	3.7	2.6	4.5	82.4	100
Greece								
No of Farms	51.7	25.4	12.1	8.3	1.5	0.8	0.2	100
UAA (ha)	6.0	11.1	11.7	18.8	7.9	6.9	37.7	100
Hungary								
No of Farms	79.0	8.0	4.6	4.8	1.3	1.1	1.3	100
UAA (ha)	2.9	3.0	3.9	9.8	6.0	9.5	64.7	100
Romania								
No of Farms	74.3	18.8	4.7	1.4	0.2	0.2	0.4	100
UAA (ha)	12.9	16.8	9.1	6.1	2.4	3.9	48.9	100
Slovenia								
No of Farms	27.5	33.4	23.4	13.9	1.3	0.5	0.1	100
UAA (ha)	4.5	17.1	25.3	33.4	7.5	5.3	6.8	100

Source: Agriculture Census – 2012, SORS, Belgrade, 2014; EUROSTAT

It can be noted that in those EU member states in our immediate environment, participation of farms with less than 10 ha significantly exceeds the EU-27 average (while in Romania and Bulgaria, it exceeds the share of the small holdings in Serbia). However, these farms have a significantly smaller part of the UAA in relation to family holdings in Serbia (in Bulgaria and Hungary, only 6.8 and 9.8%, respectively). The exception is Slovenia, with

a relatively higher share of small holdings in the UAA (about 47%) and a small share of the largest farms (about 7%). The other selected members of the EU are characterized by a significantly higher proportion of farms with more than 100 ha, which in Bulgaria exceeds 82% and in Hungary 64%.

Regional analysis of the economic size of family holdings in the Republic of Serbia according to the size of land property

The most (45%) of family holdings in Serbia have the economic size of less than 2,000 Euros (Table 3). At the same time, only 0.2% of family holdings realize SO over 100,000 EUR. Broken down by regions, it is observed that the largest shares of economically weakest (poorest) holdings are in the region Southern and Eastern Serbia (51.6%) and least represented in the region of Vojvodina (39%). In contrast, the highest share of the economically strongest holdings, which realize over 100,000 Euros, is in the region of Vojvodina (0.75%), while their share in the region Southern and Eastern Serbia, as well as in the region Šumadija and Western Serbia is extremely low (0.02 and 0.04%, respectively).

Table 3. Structure of family holdings in Serbia by Standard Output (SO) intervals, according to the Agriculture Census in 2012 (in %)

SO (EUR)	Serbia-total	Belgrade Region	Vojvodina Region	Šumadija and Western Serbia Region	Southern and Eastern Serbia Region
0-2,000	45.19	47.55	39.09	43.61	51.61
2,000-4,000	22.52	21.72	18.64	23.61	24.08
4,000-8,000	18.19	17.44	16.49	20.31	16.64
8,000-15,000	8.49	8.76	11.04	9.04	5.73
15,000-25,000	2.91	2.88	6.07	2.34	1.31
25,000-50,000	1.76	1.29	5.21	0.86	0.50
50,000-100,000	0.74	0.27	2.71	0.18	0.10
100,000 and more	0.20	0.09	0.75	0.04	0.02
Total	100	100	100	100	100

Source: Authors' calculation according to Agriculture Census – 2012, SORS, 2014, Belgrade.

The largest part of the total SO of Serbian family holdings is generated on small holdings, the size of property of up to 2 ha (22.7%) and 2 to 5 ha (20.2%). The small holdings (up to 5 ha) in the region of Southern and Eastern Serbia have the highest share in generated SO (54%), (Table 4). By contrast, the largest family holdings in Serbia (over 100 ha) account for 5.5% of the total SO, with the largest share in the region of Vojvodina (10.9%) and the lowest in the region Šumadija and Western Serbia (0.2%).

Table 4. Structure of Standard Output (SO) of family holdings in Serbia by utilized agricultural area (UAA), according to the Agriculture Census in 2012 (%)

UAA (ha)	Serbia-total	Belgrade Region	Vojvodina Region	Šumadija and Western Serbia	Southern and Eastern Serbia
< 2	22.7	18.6	28.3	15.9	21.0
2-5	20.2	28.2	7.9	30.5	32.9
5-10	19.5	24.8	10.2	29.9	25.2
10-30	18.8	18.2	18.8	20.5	16.0
30-50	5.6	3.7	9.2	2.0	2.5
50-100	7.7	2.1	14.7	1.1	1.5
> 100	5.5	4.4	10.9	0.2	0.8
Total	100	100	100	100	100

Source: Authors' calculation according to Agriculture Census – 2012, SORS, 2014, Belgrade.

The standard output per family farm in Serbia is 5,492 EUR (Table 5). The average economic size of holdings in Serbia, measured by the standard income is 4.6 times lower than the economic size of holdings in EU-27 – 25,450 EUR (Eurostat). Among the selected countries - EU member states in the region, only in Romania the average size of output per holding (2,700 EUR) is lower (approximately by 50%) compared to the Serbian average, while in other countries it is higher, in Slovenia (12,245 EUR) 2.2 times, in Greece (9,267 EUR) and Hungary (9,086 EUR) in each by about 70% and in Bulgaria (6,847 EUR) by about 25% (Eurostat, EC). The average economic size of family holdings, by regions, is the largest in Vojvodina (11,156 EUR) and twice the average for Serbia, but 2.2 times lower than the average of EU-27. The lowest economic size, i.e. the standard output per holding, is characteristic of family holdings in the region of Southern and Eastern Serbia (3,207 EUR), lower by 42% compared to the Serbian average, or about 8 times lower compared to the average for the EU-27.

Table 5. Basic indicators of economic size of family holdings in Serbia, by UAA intervals, according to the Agriculture Census in 2012 (EUR)

UAA (ha)	Serbia-total		Belgrade Region		Vojvodina Region		Šumadija and Western Serbia		Southern and Eastern Serbia	
	SO/FH	SO/ha UAA	SO/FH	SO/ha UAA	SO/FH	SO/ha UAA	SO/FH	SO/ha UAA	SO/FH	SO/ha UAA
< 2	2,595	2,973	1,489	1,805	6,282	9,892	1,477	1,537	1,319	1,376
2-5	3,768	1,171	4,209	1,330	4,543	1,410	3,755	1,152	3,342	1,055
5-10	7,489	1,091	9,271	1,373	8,761	1,249	7,448	1,086	6,277	926
10-30	16,114	1,047	19,498	1,292	18,979	1,139	14,760	1017	12,238	842
30-50	36,126	956	252,606	1,191	36,985	972	34,343	932	29,642	801
50-100	62,321	881	64,380	1,002	63,030	882	60,022	1,001	47,051	709
> 100	138,323	837	291,061	1,166	137,593	844	95,197	635	102,440	526
Total	5,492	1,222	4,378	1,377	11,156	1,386	4,105	1,137	3,206	1,005

Source: Authors' calculation according to Agriculture Census – 2012, SORS, 2014, Belgrade

The analysis of the economic size of the family holdings in respect to the size of property indicates that it is the largest, in all regions, in holdings with over 100 hectares, followed by those with 50-100 ha. The exception is the Belgrade region, where the family holdings with 30-50 ha hold the second place, according to the economic size.

The economic size of the holding, or the standard output per hectare of utilized agricultural land in the country (1,222 EUR) is by 31% lower than the average in EU-27 countries (1,770 EUR). Only Slovenia (1,892 EUR) and Greece (1,294 EUR) of the selected countries - EU member states in the region, achieve higher SO per hectare (54% and 6%) compared to the average of Serbia. Family holdings in the region of Vojvodina are characterized by the highest standard of output per hectare UAA (1,386 EUR), and holdings in the region of Southern and Eastern Serbia have the lowest economic size measured by this indicator (1,005 EUR). The SO per hectare of UAA reduces with the increasing size of the property, which can partly be explained by more extensive type of production on large properties (grain, forage and industrial crops) compared to highly intensive production, which is typically organized on small-size agriculture properties (vegetables and fruits).

Regional analysis of labour force in family holdings of the Republic of Serbia, according to the property size

According to the 2012 Census of Agriculture, total labour force in family holdings in Serbia is approximately 1.4 million people. Almost the entire contingent of labour force on holdings (about 99.9%) is the farm owners and members of their households (except those who only work part time on the farm).

Owners/keepers of households account for about 44% of the family labour force in agriculture, mostly in the region of Vojvodina, about 52% (Table 6). Other family members, at the level of Serbia, are present with about 56%, with the highest share in the region Šumadija and Western Serbia (58%) and approximately the same percentage in the region Southern and Eastern Serbia. Permanently employed labour force in family holdings is mostly present in Vojvodina region (0.4% of persons), followed by the Belgrade region, while in the remaining two regions, its involvement is extremely low.

Due to the significant participation of persons who partially/temporary (usually seasonal) work on holdings, farm labour force in agriculture can be successfully analysed on the basis of data on the AWU, and a better insight into the utilization of existing employment potential in agriculture of Serbia can be gained.

The total number of annual work units (equivalent of persons employed full time throughout the year) in family holdings in 2012, amounts to 618,054. Family labour has a dominant share as measured by this indicator and it amounts to about 95% (46% are carriers of households and 49% other family members). Permanent workers who are not members of households account for 0.2% AWU, with the largest share of 0.7% in the region of Vojvodina. Seasonal and labour employed under the contract represent 4.8% of the total labour force in family holdings in Serbia. Seasonal work force and work force engaged

under contract in family holdings is mostly present in the region of Vojvodina (about 6.7% AWU) and the least in the region of Southern and Eastern Serbia (3.6%).

Table 6. Labour force at family holdings in Serbia, according to the Agriculture Census in 2012 (persons and AWU, 000)

Labour force (LF) at family holding (FH)	Serbia-total		Belgrade Region		Vojvodina Region		Šumadija and Western Serbia Region		Southern and Eastern Serbia Region	
	Persons	AWU	Persons	AWU	Persons	AWU	Persons	AWU	Persons	AWU
Family labour force	1,414	587	74	29	277	109	625	270	439	179
-holders of FH	617	284	33	15	143	61	258	124	183	83
-other family members	797	304	41	15	134	47	367	146	255	96
Regularly employed labour	1.8	1.3	0.05	0.03	1.2	0.93	0.25	0.17	0.27	0.16
Seasonal workers	-	29	-	1.4	-	8.7	-	12	-	6.5
Contractual workers	-	0.63	-	0.02	-	0.35	-	0.17	-	0.09
Total	1,416	618	74	34	279	135	625	285	439	188

Source: Agriculture Census – 2012, SORS, 2014, Belgrade.

The analysis of labour force in family holdings of different sizes in Serbia indicates that its largest contingent, in all regions, is located on small holdings, the size of property of up to 5 ha. On average, about 73% of the total number of persons, or 61% of AWU is concentrated on these holdings (Table 7). Closely related to the fragmented ownership structure is the manifested excess labour on holdings and incomplete use of family labour force, almost throughout the year, which is why there is a need and trend of employment of some household members outside the household (Todorović et al., 2009). In contrast, the largest holdings, with over 50 ha, have less than 1% of individuals and 1.8% AWU.

Table 7. Structure of labour force at family holdings in Serbia, by UAA intervals, according to the Agriculture Census in 2012 (in %)

UAA (ha)	Serbia-total		Belgrade Region		Vojvodina Region		Šumadija and Western Serbia		Southern and Eastern Serbia Region	
	Persons	AWU	Persons	AWU	Persons	AWU	Persons	AWU	Persons	AWU
< 2	41.87	29.09	47,53	34.46	44.85	30.17	37.64	25.61	45.06	32.79
2-5	30.99	32.64	31,29	34.33	19.64	18.06	34.27	36.01	33.48	36.53
5-10	17.04	22.30	14,63	20.33	14.37	17.21	19.77	25.74	15.24	20.65
10-30	8.16	12.48	5,75	9.35	13.46	20.44	7.86	11.80	5.64	8.95
30-50	0.99	1.69	0,53	0.93	3.47	5.92	0.36	0.64	0.40	0.73
50-100	0.71	1.30	0,18	0.34	3.10	5.82	0.09	0.19	0.15	0.28
> 100	0.24	0.50	0,09	0.26	1.12	2.38	0.01	0.02	0.03	0.08
Total	100	100	100	100	100	100	100	100	100	100

Source: Authors' calculation according to Agriculture Census – 2012, SORS, 2014, Belgrade.

The Belgrade region and the region of Southern and Eastern Serbia have a dominant share of the labour force in small holdings (up to 5 ha) in excess of 78% i.e. AWU. The lowest representation of labour on the properties of up to 5ha is specific to the region of Vojvodina (about 64%). This region is characterized by the highest share of the workforce concentrated in large holdings (over 50 ha, exceeds 3%, and expressed in AWU this share was 5.8%).

The standard output per person in Serbia is 2,437 Euros and per AWU it reaches about 5,586 Euros (Table 8). With increasing size of holdings also the amount of generated SO increases, so that holdings larger than 100 ha realize the amount of 56,230 Euros per person, or 61,108 Euros per AWU. They are technically well-equipped holdings which achieve above-average productivity. The highest value of SO is achieved by such holdings in the Belgrade region, followed by the region of Vojvodina, and the lowest in the region of Southern and Eastern Serbia (34,391 Euros per person, which is about 32 thousand Euros per AWU).

Table 8. Standard output (SO) per person and per AWU, by UAA intervals, according to the Agriculture Census in 2012 (in EUR)

UAA (ha)	Serbia-total		Belgrade Region		Vojvodina Region		Šumadija and Western Serbia Region		Southern and Eastern Serbia Region	
	SO/ person	SO/ AWU	SO/ person	SO/ AWU	SO/ person	SO/ AWU	SO/ person	SO/ AWU	SO/ person	SO/ AWU
< 2	1,324	4,367	767	2,519	3,693	12,907	726	2,360	636	2,063
2-5	1,586	3,452	1,774	3,848	2,370	6,059	1,531	3,224	1,346	2,911
5-10	2,796	4,895	3,336	5,713	4,139	8,124	2,602	4,422	2,263	3,941
10-30	5,619	8,424	6,206	9,093	8,180	12,661	4,485	6,603	3,892	5,790
30-50	13,679	18,356	13,567	18,372	15,556	21,427	9,561	11,818	8,611	11,158
50-100	26,434	32,846	22,751	29,160	27,799	34,870	20,320	22,195	14,291	17,595
> 100	56,230	61,108	95,572	79,240	56,966	62,721	26,103	30,715	34,391	31,856
Total	2,437	5,586	1,965	4,678	5,855	13,765	1,720	3,805	1,368	3,228

Source: Authors' calculation according to Agriculture Census – 2012, SORS, 2014, Belgrade.

One indicator of the structure of family holdings is the number of AWU per farm. According to 2012 Census, in Serbia, number of AWU per family holding is 0.98 (Table 9), which is about 20% higher than the average of EU-27 (where the agricultural holding uses on average 0.81 AWU). Only holdings in Bulgaria (1.09) and Slovenia (1.02), of the selected EU countries, have a higher number of AWU per farm compared to the average of Serbia. The Vojvodina region is characterized by the same number of AWU per family holding as for EU-27. The highest number of AWU per family holding is characteristic of the region Šumadija and Western Serbia (1.08).

Table 9. Productivity of labour on family farms in Serbia (AWU/FH and AWU/ha UAA), by UAA intervals, according to the Agriculture Census in 2012

UAA (ha)	Serbia-total		Belgrade Region		Vojvodina Region		Šumadija and Western Serbia		Southern and Eastern Serbia Region	
	AWU/ FH	AWU/ UAA	AWU/ FH	AWU/ UAA	AWU/ FH	AWU/ UAA	AWU/ FH	AWU/ UAA	AWU/ FH	AWU/ UAA
< 2	0.594	0.681	0.591	0.716	0.487	0.766	0.626	0.652	0.640	0.667
2-5	1.092	0.339	1.094	0.346	0.750	0.233	1.165	0.358	1.148	0.363
5-10	1.530	0.223	1.623	0.240	1.078	0.154	1.685	0.246	1.593	0.235
10-30	1.913	0.124	2.144	0.142	1.499	0.090	2.235	0.154	2.114	0.146
30-50	1.968	0.052	13.750	0.065	1.726	0.045	2.906	0.079	2.656	0.072
50-100	1.897	0.027	2.208	0.034	1.808	0.025	2.704	0.045	2.674	0.040
> 100	2.264	0.014	3.673	0.015	2.194	0.013	3.099	0.021	3.216	0.017
Total	0.983	0.219	0.936	0.294	0.810	0.101	1.079	0.299	0.993	0.311

Source: Authors' calculation according to Agriculture Census – 2012, SORS, 2014, Belgrade.

The existing ownership structure significantly affects the productivity of labour in agriculture of Serbia, which can be perceived through the number of hectares of agricultural land that is cultivated/used by single AWU. Thus, in the EU-27, on average, single AWU is processing 16.7 ha of agricultural area and in family holdings in Serbia 4.6 ha. It can be concluded that the labour productivity, as measured by this index, in Serbian agriculture is by 3.6 times lower than the average for the EU-27. All selected countries in the region, members of the EU-27, achieve higher labour productivity in agriculture in relation to family holdings in Serbia, measured by the above indicator, where on average one AWU cultivates 11 ha of UAA in Hungary and Bulgaria, 8.3 ha in Romania, followed by 8.1 ha in Greece and 6.3 ha in Slovenia.

The relatively high labour input is in Slovenia (16.2 AWU/100 ha in 2011), in Poland (14.5 AWU/100 ha in 2011), in Greece (12.3 AWU/100 ha), in Romania (11.8 AWU/100 ha), in Portugal (9.9 AWU/100 ha), in Hungary (9.2 AWU/100 ha) and in Bulgaria (9.1 AWU/100 ha in 2011). Malta and Cyprus have also high labour input but they are not agriculturally important countries within the EU. These countries use more on-farm manual workers. This disproportion in labour input causes the low level of income indicators per AWU (Spicka, 2013).

With the increasing size of the land property, evident is the increase of productivity of family holdings in Serbia. On the largest holdings (over 50, or 100 ha), it exceeds the average level of productivity achieved in the agriculture of the EU-27. It is reasonable to expect that these holdings can be competitive to holdings in the EU.

Broken down by region, in Serbia, favourable ratio of labour force expressed in AWU and used agricultural land (indicating the highest level of labour productivity) exists in the region of Vojvodina, where on the family holdings one AWU is processing on average 9.9 ha of agricultural area, which is over two times more than the national average, but it

is by about 10% lower than the average for the EU-27. In comparison to the EU member states from the region, realized labour productivity on holdings in the region of Vojvodina is higher, except when compared with farm holdings in Hungary and Bulgaria. Low labour productivity in agriculture in Serbia, measured by these indicators (five times less than the average of EU-27) is present in the region of Southern and Eastern Serbia, and Šumadija and Western Serbia, reflecting the particularly unfavourable agrarian structure of the region.

Conclusion

The Republic of Serbia is territorially very heterogeneous in terms of economic development of certain regions and family holdings in them differ significantly in regard to the ownership structure, available labour force and its structure, as well as economic size. Unfavourable ownership structure significantly determines the efficiency of operations in agriculture and it seems that the agriculture in Serbia, in many areas, in the face of increasing competition, cannot be competitive in the market, especially highly developed economies. Family holdings with over 100 ha of land in Serbia account for only 0.2% of the total number, and have only 8% of UAA, while in the EU these holdings account for 2.7% of the total number, and dispose with 50.9% of UAA. The family holdings in the region of Vojvodina have the most favourable ownership structure, where the largest farms make up 0.9% of the total number and hold in their possession approximately 18% of UAA.

The standard output per family holding in Serbia is 5,492 EUR and it is 4.6 times lower than the average economic size of holding and the EU – 25,450 EUR, and lower than the value of this indicator in all selected countries - EU member states (Bulgaria, Hungary, Greece, Slovenia) in the region, except in Romania. The average economic size of family holdings, by region, is the largest in the region of Vojvodina (11,156 EUR) and it is twice the Serbian average, but 2.2 times lower than the EU average, and above the level achieved in selected countries in the region, with the exception of Slovenia. The lowest economic size, i.e. the standard output per holding, is characteristic of family holdings in the region of Southern and Eastern Serbia (3,207 EUR), and it is lower by 42% than the Serbian average, or about 8 times lower compared to the average for the EU-27.

Number of AWU in Serbia per family holding is 0.98, which is by about 20% higher than the average for the EU, where the family holding uses on average 0.81 AWU. The Vojvodina region is characterized by the same number of AWU per family holding as the EU average, however, the highest number of AWU is characteristic of the region of *Šumadija* and Western Serbia 1.08.

The current ownership structure significantly affects the productivity of labour in agriculture of Serbia. In the EU, on average, single AWU processes 16.7 ha of agricultural area and in family holdings in Serbia 4.6 ha. The labour productivity, as measured by this index, in Serbian agriculture is 3.6 times lower than the EU average. All selected countries - members of the EU-27, in the region, achieve higher labour productivity in agriculture in relation to family holdings in Serbia, measured by the above indicator. Broken down by region, in Serbia, the highest level of labour productivity is achieved in the region of Vojvodina, where, on the

family holdings, one AWU processes on average 9.9 ha of agricultural area, which is more than twice the national average, but it is by about 10% lower than the average for the EU27. Compared with the realized labour productivity on farms in selected EU member states in the region, family holdings in the region of Vojvodina, as measured by the above indicator, have higher labour productivity, except compared to Hungary and Bulgaria. The lowest labour productivity in agriculture in Serbia, measured by these indicators (five times lower than the EU average) is present in the region of Southern and Eastern Serbia, and the region of *Šumadija* and Western Serbia, reflecting a very unfavourable agrarian structure of the region.

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REGIONALNI ASPEKTI STRUKTURNIH PROMENA NA PORODIČNIM GAZDINSTVIMA REPUBLIKE SRBIJE

Dragica Božić[6], Petar Munćan[7]

Apstarkt

Polazeći od značaja koji veličina poseda ima za razvoj poljoprivrede i njenu efikasnost, u radu je analizirana posedovna struktura, njena međuzavisnost sa raspoloživom radnom snagom (broj lica i godišnje radne jedinice) i ekonomskom veličinom porodičnih gazdinstava. S obzirom da je teritorija Republike Srbije veoma heterogena u pogledu dostignutog stepena privredne razvijenosti pojedinih regiona, kao i raspoloživih potencijala za razvoj poljoprivrede, to su navedene strukturne promene analizirane na nivou četiri regiona: Region Vojvodine, Beogradski Region, Region Šumadije i Zapadne Srbije, i Region Istočne i Južne Srbije. Ključni pokazatelji strukture poridičnih gazdinstava Srbije prikazani su i u komparaciji sa prosekom za EU-27. Cilj rada je da se sagledaju osnovni aspekti strukturnih promena na porodičnim gazdinstvima, polazeći, prvenstveno, od veličine poseda, raspoložive radne snage, ekonomske veličine, kao i njihove regionalne raznolikosti.

***Ključne reči**: porodično gazdinstvo, region, posedovna struktura, ekonomska veličina, radna snaga.*

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