Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 19, Issue 2, 2019
PRINT ISSN 2284-7995, E-ISSN 2285-3952

TRENDS IN CONCENTRATION OF BULGARIAN AGRICULTURE

Rositsa BELUHOVA-UZUNOVA

Agricultural University – Plovdiv, 12 Mendeleev Blvd, Plovdiv, Bulgaria, Phone: +35932654382, Email: rosicab_uzunova@abv.bg

***Corresponding author*:** rosicab_uzunova@abv.bg

Abstract

The integration to the EU led to serious changes in Bulgarian agriculture. The implementation of Common agricultural policy caused significant transformations in farm structures. There are substantial variations in the number and the size of the agricultural holdings. The aim of the study is to highlight the main trends in the level and dynamics of concentration in Bulgarian agricultural sector. The Lorenz curve, as the most widely used measure of inequality, is applied in the paper to analyse the process of concentration and the distribution of agricultural holdings. The results indicate that the large structures continue to grow, while small farms are disappearing. The survey shows insubstantial role of medium-sized holdings, polarization and dualistic structure of Bulgarian agriculture.

***Key words*:** *direct payments, structural changes, polarization*

INTRODUCTION

The EU enlargement caused serious transformation in the structure of agricultural holdings across Europe. The process of concentration in the EU Member states provokes debate among researchers, farmers and policy makers. The trends in the distribution of agricultural holdings are highlighted by number of studies [13, 14, and 17]. Piet et al. [12] observe the role of several drivers of farm-size inequality in France. Loughrey et al. [8] investigate the distribution of agricultural land in Western Europe by focusing on spatial clusters. The OECD published report on the subject for a set of 14 countries - two in Asia (Korea, Japan), two in America (Canada, the USA), and ten EU Member states [3]. According to the Transnational Institute [19] there are severe challenges related to the term "land grabbing" in the EU: "Europe is currently experiencing tremendous and rapid land concentration. This process is adversely affecting the lives and livelihoods of millions of small-scale farmers and agricultural workers"[19].

Therefore the overconcentration raises concerns about the future of European agriculture. In Bulgaria this process is changing the rural areas significantly, and is causing a number of social, economic and ecological challenges.

After the accession to the EU there is substantial variation in Bulgarian agricultural structure. The number of holding is declining and the average farm size is increasing. Although there are some positive trends and changes, the agricultural sector is characterized by unbalanced distribution of the holdings and domination of the large farms.

The aim of the study is to highlight the main trends in the level and the dynamics of concentration in Bulgarian agricultural sector and to formulate recommendation for balanced and sustainable development.

The study is structured as follows: First section presents the materials and methods of the study. Second, the dynamics and different dimensions of concentration are observed. The survey focuses on the comparison with EU average. In the third section some important conclusions and recommendations are outlined.

MATERIALS AND METHODS

The main purpose of the study is to examine changes and trends in concentration and distribution of farms by UAA and Standard Output between 2003 and 2016. The results

could be starting point for a discussion about future of CAP after 2020.

The data is collected by Eurostat Database (Farm Structure Survey 2003, 2010, 2016) and Ministry of agriculture, food and forestry in Bulgaria.

The changes in economic size and concentration are conducted by using the Eurostat classification of farms. "By economic size (based on standard output in EUR), agricultural holdings form nine groups" [4].

In the paper is applied Lorenz curve as a main indicator for inequality [20]. The curve presents income distributions as proposed by Lorenz [9]. After Krugman [7] Lorenz curve and Gini coefficient have become a widely used method for measuring geographic concentration. The Lorenz curve and the Gini coefficient are applied in number of studies for observing concentration of agricultural structures [10, 14, and 18].

This approach is conceptually similar to the method "by quantiles" [2]. Functional relation proposed by Rasche *et al*. [15] is used in the survey to estimate Lorenz curves. The explicit functional form is shown in the equation 1:

$$L(F; q) = [1 - (1 - F(q))^{\alpha}]^{1/\beta} \quad (1)$$

$$0<\alpha\leq 1,\ 0<\beta\leq 1$$

L (F; q) is the cumulative distribution of the operated hectares or standard output and F (q) is cumulative distribution of number of holdings. The function possesses the proper convexity and slope constraints to assure that it always lies in the lower triangle of the unit square [15].

In the study, the Lorenz curve is constructed based on two indicators – utilized agricultural area and standard output. The main purpose is broader analysis of the level of concentration and the changes in farm structures.

RESULTS AND DISCUSSIONS

The study focuses on the changes in terms of physical and economic size of Bulgarian farms after accession to the EU. The survey aims to answer the question whether the CAP implementation stimulates Bulgarian agriculture in resolving some issues, which have occurred during the transition period.

According to EUROSTAT [5] in 2016 the UAA is over 17 million hectares and there are more than 10.3 million farms in the EU.

In Bulgaria the UAA and the number of holdings are only 2% of all area and all farms in the EU (Table 1). In 2016, the results from Farm structure survey conclude that nearly 33% of all EU farms are in Romania and 14% - in Poland [5].

Table 1. Farm holding and utilized agricultural area, 2016

Country	Number of holdings		Utilized agricultural area (UAA)		Small farms (under 5 ha)		Large farms (> 50 ha)	
	in thousands	share of EU total (%)	in 1,000 ha	share of EU total (%)	share of all farms (%)	share of UAA (%)	share of all farms (%)	chare of UAA(%)
EU-28	10,321.2	100.0	171,288.5	100.0	65.4	6.1.	7.0	68.1
Bulgaria	202.7	2.0	4,468.5	2.0	82.6	2.9.	4.8.	87.3

Source: Farm structure Survey 2016.

More than 65% of all farms in the EU 28 are small. On the other hand 68% of UAA is concentrated in 7% of farms (farm size more than 50 hectares). Large farms are dominating structures in Luxembourg (52%) and France (41%).

The distribution of holdings is most uneven in Romania. Around 92% of the farms are under 5 ha while less than 1% of all structures is more than 50 ha, concentrating approximately 50% of the total UAA.

In Bulgaria the level of concentration is higher than EU average. Nearly 88% of all UAA is in large structures, although they represent less than 5% of all holdings. Small farms (under 5 ha) accumulate only 2% of agricultural area.

The results indicate that there is dualistic structure of Bulgarian agriculture, which raises concerns about the opportunities for balanced development in the sector. The implementation of the CAP caused overconcentration and substantial changes in specialization patterns. The country becomes producer of extensive crops and exporter of raw materials and primary products. By contrast, the production of extensive crops and livestock are declining [1].

Figure 1 represents the evolution in Bulgarian farm structure for the period 2003-2016. In Bulgaria the transition period is associated with substantial transformations in agriculture. The political and the economic instability during the 90s caused serious problems with land fragmentation and a decrease of agricultural production. The pre-accession period is characterized by a decrease in the number of the farms and their consolidation. After the accession to the EU, the implementation of the CAP has caused further changes in farm structures. For the past 30 years there are serious variations and restructuring in the sector.

For the period 2003-2016 there is downward trend in the number of farms, and the rate of decline in the country is more than 70%. These changes are typical for the almost all Member states in the EU. In the 2003-2013, the number of farms has declined by half, not only in Bulgaria, but also in Slovakia and Italy.

In 2016 in Bulgaria are registered 200 thousand agricultural holdings [11]. Compared to their number in 2013 and 2010, the decrease is with respectively 21% and 46%.

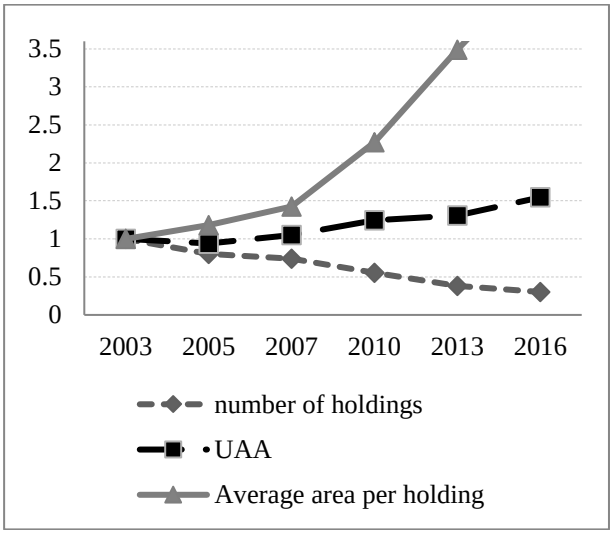

Fig. 1. Changes in Bulgarian agricultural structure (2003=1)
Source: Own calculation based on Ministry of agriculture, food and forestry.

For the period 2003 – 2016 in Bulgaria is observed the highest increase in the UAA, although the country accounts for only 2% of the total UAA in the EU-28. In 2016 France and Spain are the two Member States with the largest UAA, with respectively 16% and 13.2%, followed by United Kingdom (10%) and Germany (9%).

The trends across the Member-States are similar. While more than 25% of the farms disappeared between 2003 and 2016, the total utilized agriculture area remains stable. Therefor the average area per holding increases from 11.7 hectares in 2003 to 16.59 hectares in 2016 [5]. In 2016, in the Czech Republic is observed the highest average farm size (130 ha), followed by the United Kingdom (90 ha). The average farm size is below 10 hectares in Malta (1.2 ha), Cyprus (3.2 ha) and Romania (3.7 ha). In Bulgaria, however is registered major growth in the average farm size. In the beginning of the analyzed period the average size of the holdings is 4.4 hectares. In 2016 the average size rises nearly 5 times to more than 20 ha.

The results show some positive trends – the average farm size and the utilized agricultural area are increasing. On the other hand, wider and broader analysis of Bulgarian farm structure observes some alarming processes.

Figure 2 presents the distribution of agricultural holding by economic size for the period 2003-2016.

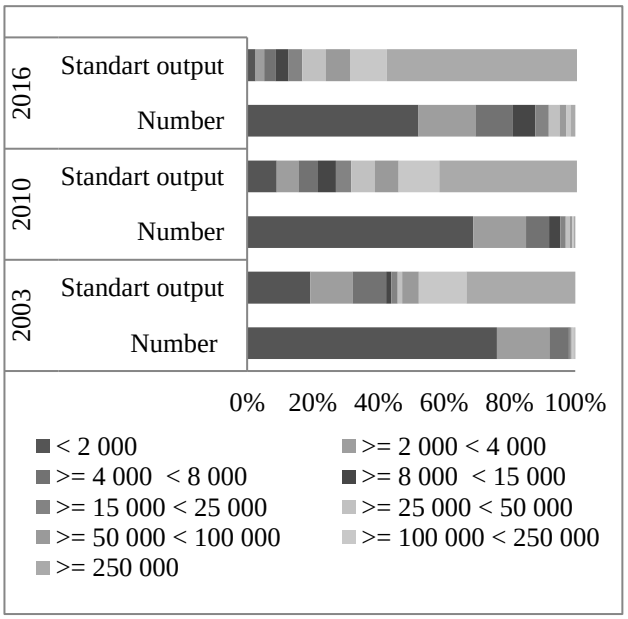

Fig. 2. Distribution of holdings by economic size
Source: Own calculation based on Farm Structure survey.

The data analyze the share of farms in number of holdings and produced standard output in Bulgaria.

For the analyzed period the share of small farms (below 2,000 EUR) in the number of holdings and in the standard output is declining respectively with 23% and 17%. On the other hand, the share of large farms (over 250,000 EUR) in the number of holdings is increasing gradually (1.2%). However, there is a significant growth in their share in the standard output (more than 25% of the total standard output in the country).

The results outline other major issue concerning Bulgarian agriculture - the insufficient role of medium-sized farms. The share of the holdings between 8,000 EUR and 50,000 EUR is around 13% and they account for only 15% of the standard output. Despite the accession to the EU, the polarization of Bulgarian agriculture is broadening and the country could not form balanced agricultural structure.

For the period 2003-2016 the dynamics in the level of concentration is observed by Lorenz curve. The abovementioned indicator corresponds to the objectives of the analysis and characteristics of agricultural sector. Lorenz curves are a graphical presentation of inequality [9]. This approach allows visual impression of farms structure distribution in Bulgaria.

Figure 3 shows the changes in Lorenz curves based on the physical size.

In Bulgaria the level of concentration and the inequality distribution are increasing. In 2003 the share of holdings under 0.5 ha is 62% and they accumulate only 3% of the UAA. By contrast, less than 1% of farms is over 100 ha but poses 78% of the UAA. In 2010 disproportions are increasing. The share of small structures is more than 60%, but they account for only 1% of the UAA. On the other hand the large holdings over 100 ha (2.3% of all farms) are handling 84% of the area. In 2016 the over-concentration is furtherly broadening.

The results based on the Lorenz curve are in parallel with the trends observed by the analysis of economic size of holdings. The farm structure is characterized by concentration of UAA in the large holdings, insignificant role of the small ones and the reduction of their share in the total number of farms.

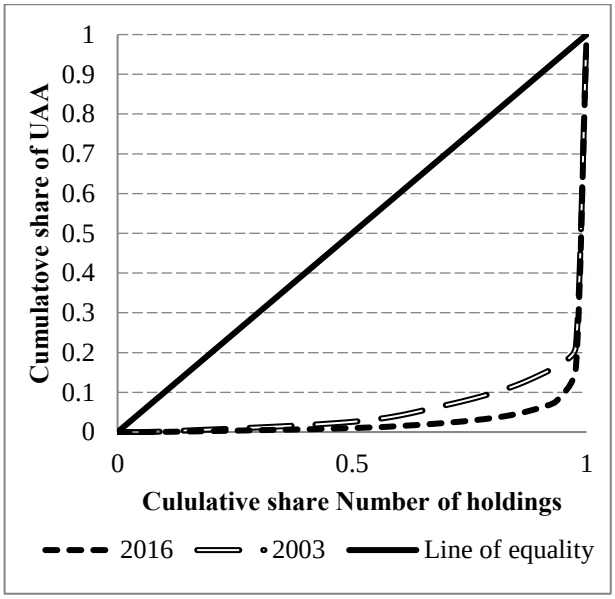

Fig. 3. Lorenz curve based on UAA
Source: Own calculation based on Ministry of agriculture, food and forestry.

After the accession to the EU, the group of small farms is declining. The reduction however is not related to the increase of their size but is due to the suspension of their activities. On the other hand, the dominance of large farms increases and process in these structures does not correspond to changes in other classes of farms.

The Lorentz curve, compared to the line of equality, shows an increase in concentration and inequality in terms of number of farms and their economic size (Figure 4).

In 2003 76% of all holdings are very small (economic size under 2000 EUR) and account for more than 20% of the standard output. In 2010 these farms are approximately 68% but provide only 9% standard output. By contrast, in 2003 the farms with the largest economic size (over 250,000 EUR) are only 0.2% of the total number, but account for 35% of the standard output. In 2010, there is an increase in the share of large structures and they are 1% of all farms. These holdings produce more than 54% of the standard output. In 2016, the share of large farms is growing and they are 1.4% of all holdings. The same trends are

observed in their share in standard output (58%). On the other hand, the farms with economic size under 2,000 EUR provide less than 4% of the SO.

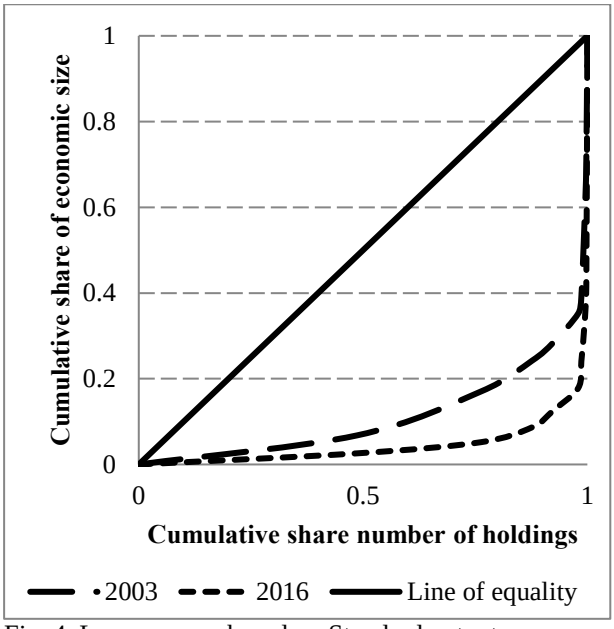

Fig. 4. Lorenz curve based on Standard output
Source: Own calculation based on Ministry of agriculture, food and forestry.

These results indicate that there is concentration of standard output in the large structures. By contrast, the significance of small farms is declining as they provide only insubstantial share of the standard output. Another important conclusion is related to the medium-sized farms. Although their share increases, these farms still play insufficient role in Bulgarian agriculture.

The analysis indicates for a dualistic structure of holdings in Bulgaria. The data shows that small farms are diminishing, and so is their importance and economic size. Different trends are registered for large structures. They improved their performance and dominate in Bulgarian agricultural structure.

There are differences between the two types of Lorenz curves - calculated on the basis of economic size and based on the UAA. First, the level of concentration concluded on base of the UAA is higher than the one related to the economic size. The higher values are mainly associated with the role and importance of livestock farms, which are not represented by Lorenz curve based on the UAA. Therefor indicator outlines greater imbalance between small and large structures. Secondly, with the expansion of UAA, the land is absorbed more intensively, which also reflects the Lorenz curve. Despite the indicated differences in both types of curves, similar trends and variations in the structure of agricultural holdings have appeared.

The analysis of farm distributions by physical and economic size show that the transformations could not lead to the expected results. Although there are some positive changes, many unsolved problems still are challenging the sector.

The main reasons for the transformations are associated with the implementation of the CAP and the financial support in form of direct payments. There is a serious imbalance in financial aid distribution [6]. Substantial subsidies are provided to large structures, while small farms could not receive funds because they do not meet the EU criteria or there is an insignificant financial support. „The change in development policies both at national and international level requires new approaches to be used in rural areas“ [16].

The uneven financial support distribution influenced the processes of specialization and concentration of Bulgarian agriculture. The dominance of extensive farming and the problems in the livestock and in the intensive crops changed the production structure and export list of the country. Bulgaria become major exporter of wheat and sunflower seed, while the importance of the high value added products in is decreasing. The abovementioned trends are reflecting the opportunities for sustainable development of Bulgarian agriculture and cause serious imbalances.

CONCLUSIONS

Based on the analysis, some conclusions and recommendations could be highlighted:

After the accession to the EU, the changes and the dynamic in the process of concentration demonstrate that there is an irrational dualistic structure in the country. Despite the increase in the average farm size, the polarization of agricultural holdings remains.

There is a strong differentiation in crop production, both at sectoral and regional level. Although the intensive sectors are always characterized by a higher UAA than the intensive ones, the role of vegetables, fruits and vineyards is reducing substantially comparing to cereals and oilseeds.

Despite the significant increase in the level of concentration, livestock farms are small and fragmented. These trends hamper the development of rational concentration and optimal size.

The variations of concentration, analyzed by the Lorenz curve indicate major disproportions in Bulgarian agriculture.

Lorenz curve show the main features of Bulgaria agriculture – imbalanced farm structure - too many small farms with insignificant economic size and a small number of large structures that provide a much larger share of standard output.

In the new programming period, the CAP needs serious revision – the main priorities of the Pillar 1 should be related to greater support of small and medium-sized farms.

The CAP after 2020 should include new redistributive land policies, reduction of direct payments and better targeting. The EU funds should be directed to family farms in order to stop and reverse the processes of overconcentration.

Some of the schemes represented and designed in the 2014-2020 programming period (for example Young Farmer scheme and Small farms scheme) are showing insufficient results not only in Bulgaria. They are not efficient enough and could not provide support to majority of Bulgarian farmers.

The CAP should continue to change and evolve. Despite the considerable support of the CAP, EU agriculture is unviable and dependent on poorly targeted direct payments.

The national agricultural policy in Bulgaria should direct the financial support to traditional sectors with high value added and stimulate the development of family farming.

ACKNOWLEDGEMENTS

This survey is part of the Project 05-18 “Impact of the agricultural structural changes on rural development in Bulgaria”, financed by the Centre of Research, Technology transfer and protection of intellectual property rights at the Agricultural University-Plovdiv.

REFERENCES

[1]Atanasov, D., Popova, B., 2010, Sustainable development characteristics of different dairy farms in Bulgaria, Trakia Journal of Science, Volume 8, Suplement 1, p.245.

[2]Beluhova-Uzunova, R., Atanasov, D., Hristov, K, 2017, Analysis of direct payments distribution in Bulgarian Agriculture, Trakia Journal of Sciences, Vol. 15, Suppl. 1, pp 282-287.

[3]Bokusheva, R., Kimura, S, 2016, Cross-country comparison of farm size distribution. OECD Food, Agriculture and Fisheries Papers 94, OECD Publishing, Paris (France).

[4]Eurostat, 2015, Farm structure survey 2013 - main results, Data extracted in November 2015, https://ec.europa.eu/eurostat/statistics-explained/index.php/Farm_structure_survey_2013_-_main_results, Accessed on 18/03/2019.

[5]Eurostat, 2018, Farm structure survey 2016, Press release, 105/2018 - 28 June 2018, https://ec.europa.eu/eurostat/documents/2995521/9028470/5-28062018-AP-EN.pdf/8d97f49b-81c0-4f87-bdde-03fe8c3b8ec2, Accessed on 18/03/2019.

[6]Hristov, K., 2011, Institutional problems small farmers face when applying for assistance under the rural development program (2007-2013), Trakia Journal of Sciences,Suppl.3, Vol.9, pp 83-87.

[7]Krugman, P., 1991, Geography and Trade, MIT Press, Cambridge.

[8]Loughrey, J., Donnellan, T., Lennon, J, 2016, The Inequality of Farmland Size in Western Europe. In 90th Annual Conference of the Agricultural Economics Society. Warwick (UK).

[9]Lorenz, M, 1905, Methods of measuring the concentration of wealth. Quarterly Publications of the American Statistical Association, 9, New Series, No. 70: 209-219.

[10]Merce, E., Merce, C., Dumitras, D., 2010, Characterization of the Degree of concentration in agriculture using the Gini coefficient, Bulletin UASVM Cluj Napoca, Horticulture, 67(2), p.150-154.

[11]Ministry of Agriculture, Food and Forestry, Agrostatistics, Farm Structure Survey for 2003, 2007, 2010, 2013, 2016.

[12]Piet, L., Latruffe, L., Le Mouël, C., Desjeux, Y, 2012, How do agricultural policies influence farm size inequality? The example of France. European Review of Agricultural Economics 39: 5–28.

[13]Piet, L, 2016, Recent trends in the distribution of farm sizes in the EU, 149th EAAE Seminar ‘Structural change in agri-food chains: new relations between farm sector, food industry and retail sector’ Rennes, France, October 27-28, 2016.

[14]Popescu, A., Alecu, I.N., Dinu, T.A., Stoian, E., Condei, R., Ciocan, H., 2016, Farm structure and land concentration in Romania and European Union`s agriculture, Agriculture and Agricultural Science Procedia, 10 (2016): 566 – 577.
[15]Rasche, R., Gaffney, J., Koo, A.Y., Obest, N., 1980, Functional forms for estimating the Lorenz curve. Econometrica 48(4):1061–1062.
[16]Shishkova, M, 2017, Social Network Analysis of the Organizations Implementing Leader Approach in Bulgaria, Bulgarian Journal of Agricultural Economics and Management, Vol. 62, Issue 3, pp. 35-39.
[17]Toma, E., Vlad, I, 2018, Land concentration changes in Romania during 2002-2016 period, Agro Life Scientific Journal. Volume 7, Number 1, 137-142.
[18]Todaro, M, 2003, Economic Development. (8th Ed.). Toronto: Addison-Wesley.
[19]Transnational Institute, 2013, Land concentration, Land grabbing and people's struggles in Europe, Final Report. Published by the Transnational Institute (TNI) for European Coordination via Campesina and Hands off the Land network, Amsterdam, Netherlands. https://www.tni.org/files/download/land_in_europe-jun2013.pdf, Accessed on 18/03/2019.
[20]Ultsch, A., J. Lötsch, 2017, A data science based standardized Gini index as a Lorenz dominance preserving measure of the inequality of distributions. PloS one. 12(8), https://www.ncbi.nlm.nih.gov/pubmed/28796778, Accessed on 18/03/2019.