



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

The Impact of the Common Agricultural Policy on Romanian Farming Structures. Who are the Winners and who are the Losers?

IONEL-MUGUREL JITEA, CRISTINA BIANCA POCOL

University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca,
Department of Economic Sciences, Romania
mjitea@usamvcluj.ro, cristina.pocol@usamvcluj.ro



**Paper prepared for presentation for the 142nd EAAE Seminar
Growing Success? Agriculture and rural development in an
enlarged EU**

May 29-30, 2014
Corvinus University of Budapest
Budapest, Hungary

Copyright 2014 by Jitea I.M. and C.B. Pocol. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

Abstract

The General Agricultural Census (2010) showed that in the European Union (EU) there are 12.2 million farms with an average physical size of 14.2 hectares. 31.5% are located in Romania (3.85 million) with an average area of only 3.4 hectares (more than two-thirds have less than 2 hectares). In this context, the paper aims to reveal what were the main effects produced after applying the Common Agriculture Policy regulations in Romania on the farm structures. It investigates if there are evidences of production concentration, questioning in the same time the policy measures' effectiveness for the semi-subsistence and subsistence farms using a Gini-Struck coefficient. The paper also points out the productivity gains as response to the subsidy incentives, by using a Total Factor Productivity index (TFP). The models were initialized with aggregate national and regional panel data collected from national and EU official statistics (1998 -2013). The Gini-Struck coefficients showed that the farms with less than 2 hectares reduced their share with almost 10% from the total and those bigger than 100 hectares increased their number with almost one third. Thus, the rift between the two extreme polls (small and big size farms) becomes even more important. The policy incentives had positive effects on the TFP index that increased in average with 0.4% per year and it became less sensitive to the environmental variability conditions.

Keywords: CAP, farming structures, Romania.

Introduction

The outcomes of agricultural policies on farming structures have long been the interest for the policy makers and the scientists (Key and Roberts, 2007). The growth of the average farm size is one of the indicators that show structural changes in agriculture (Piet et al., 2011). The studies focus both on the drivers of the structural changes but also on their effects. The lease of the agricultural land is considered an important driver of the structural changes in agriculture, helping to the creation, enlargement and modernization of farms (Suchoń and Baum, 2013). Another one is the investment decision, this being influenced by different factors like: specialization, existence of a successor, the farmer's age, labour management, subsidies per hectare, location and expectations (Viaggi and Raggi, 2011).

Previous studies show that any public measures and interventions have important consequences on farm structures (Sahrbacher, 2012). The increase of farm profitability (Yee and Ahearn, 2005), the farm modernization (Kazukauskas et al. 2013) and the technical efficiency gains (Alvarez and Arias, 2005) were established to be the main important positive effects. Early contributions to the understanding of CAP impact on the farm development (Kazukauskas et al., 2013) show a positive effect of the decoupling policy on the farm productivity and specialization. These were accompanied by intensification that proved to negatively affect biodiversity (Henle et al., 2008). It creates highly economic pressures for the farms located in marginal agricultural areas that are usually pushed to quit farming. Most of the times, they are subsistence or semi-subsistence holdings highly economic vulnerable and policy dependent (Davidova et al. 2009).

Csaki and Jambor talk about the handicap of small farms in the new European Member States, these entities being extremely different from those belonging to EU15. This handicap was materialized in the insufficient support, before and after the accession to the EU and the lack of access to regional and national markets (Csaki and Jambor, 2013). Spicka describes the disparities between EU 15 and the New Member States in terms of agricultural structure

characteristics, Romania being a country with low income, small farms and high labour input (Spicka, 2013). Thomson (2014) showed that the CAP Pillar I measures were against small farms, especially in the New Member States, due to the eligibility criteria, while Pillar II measures excluded some of the small farms due to the complexity of procedures (Thomson, 2014).

There is a proven contrast between the citizen's expectations and the CAP outcomes: decline of the agricultural labour force and increase of the big farms (Zier, 2013). In this context, the paper aims to reveal what were the main effects produced after applying the Common Agriculture Policy regulations in Romania on the farm structures. It investigates if there are evidences of production concentration, questioning in the same time the policy measures' effectiveness for the semi-subsistence and subsistence farms. The paper also points out the productivity gains as response to the subsidies incentives.

Material and methods

The farm size concentration was estimated with a Gini – Struck coefficient (1). It is a measure of concentration in a population and its values can range from 0 to 1 (1 indicating total concentration) (Yao, 1996). The statistical data was taken from the Eurostat database and the concentration investigated for the number of farms and the utilized agricultural area before (2003 – 2005) and after joining the EU (2007 – 2010).

$$GS = \sqrt{\frac{n \sum_{i=1}^n p_i^2 - 1}{n - 1}} \quad (1)$$

Where: n: number of different farm size classes (9 classes: 0 ha; less 2 ha; 2 – 4.9 ha; 5 – 9.9 ha; 10 -19.9 ha; 20 -29.9 ha; 30 -49.9 ha; 50 – 99.9 ha; over 100 ha);
 p_i: frequencies in different farm classes;

The productivity gains as response to the policy incentives were investigated with the help of the surplus accounting techniques and the additive indexes. These methods were used to estimate the Total Factor Productivity (TFP) changes, consumers) before and after Romania's joining the EU (Boussemart et al., 2012) (2).

$$\frac{dTFP}{TFP} = \frac{\sum_{j=1}^J p_j dy_j - \sum_{i=1}^I w_i dx_i}{\sum_{j=1}^J p_j y_j} \quad (2)$$

Where: J: number of different outputs; P_j: price of output y_j; I: number of different inputs; W_i: price of input x_i;

The methodology of the Agricultural National Accounts was used to initialise the productivity gains model (Eurostat, 2000). The accounts were expressed in current currency (100=2013). The output vector represents 28 different products (21 crops, 7 animal products) while the input vector has 14 specific inputs (Table 1).

Table 1. Inputs and outputs utilised in the productivity gain calculation

Inputs	Outputs	
<p>Intermediate Inputs:</p> <ul style="list-style-type: none"> - Seeds and Planting Stock - Energy and Lubricants - Fertilisers and Soil Improvers - Pesticides - Veterinary Expenses - Feeding stuffs - Maintenance of Buildings and Materials - Agricultural Services - Other Good and Services <p>Fixed Capital Consumption</p> <p>Land</p> <p>Hired Labour</p> <p>Governmental Support</p>	<p>Crop Outputs:</p> <ul style="list-style-type: none"> - Wheat - Rye - Barley - Oats - Grain Maize - Rape - Sun Flower - Soya - Protein crops - Raw Tobacco - Sugar Beet - Fibber Plants - Hobs - Fodder Maize - Cauliflower - Tomatoes - Potatoes - Apples - Pears - Peaches - Grapes 	<p>Animal Outputs:</p> <ul style="list-style-type: none"> - Cattle - Sheep and Goats - Pigs - Poultry - Eggs - Milk - Dairy Products

Source: National Institute of Statistics, Romania, 2014.

The model was initialized with aggregate national and regional panel data. They covered twelve years horizon time (1998 – 2013) being collected from national and EU official statistics. The intermediate inputs data and the fixed capital consumption came from the national Tempo Online database (<https://statistici.insse.ro/shop/>). Land quantity was expressed as the total utilised agricultural area (hectares) and its value was obtained by multiplying an average land price obtained from national official statistics. The governmental support was derived from the Romanian Agricultural National Accounts.

Results and discussion

The statistical data issued immediately after the Romanian EU's accession (2007) proved that there are evident structural drawbacks when comparing the Romanian agriculture with the European one (Fig. 1a). However it can be noticed that the proportion of the farms smaller than 1 hectare decreased as a response to the establishment of a minimum 2 hectares eligible threshold for the first CAP's pillar payments (-12%) (Fig. 1b).

The Analysis of Concentration Phenomenon in Romanian Agriculture as Response to Policy Incentives

The number of the single holder farms remained concentrated in small-size classes in all Romanian development regions (74.6% of farms had less than 2 hectares). In the same time, the utilised agricultural area became less concentrated in the small size classes (only 23% of land is concentrated in farms smaller than 2 hectares). Thus for this type of farming there can be seen only a slight improvement of farms structure after the EU accession. The ones that were not eligible for the direct payment scheme still represent an important percentage from the total. They are the main losers of the CAP financial allocation. Their future survival is questioned by the better financial distribution among farm structures and targeted policy measures. On the other hand the farming structures are better organised in the North, North-West and Centre development regions due to historical particularities but also as response to capital investments. The concentration was less present in the regions with environmental payment schemes target to support environment friendly farming practices (mountain regions, high natural value areas). Such policy incentives can contribute to the semi-subsistence farm survival but have little relevance for the subsistence farms due to a minimum imposed size threshold that makes them non-eligible for payments.

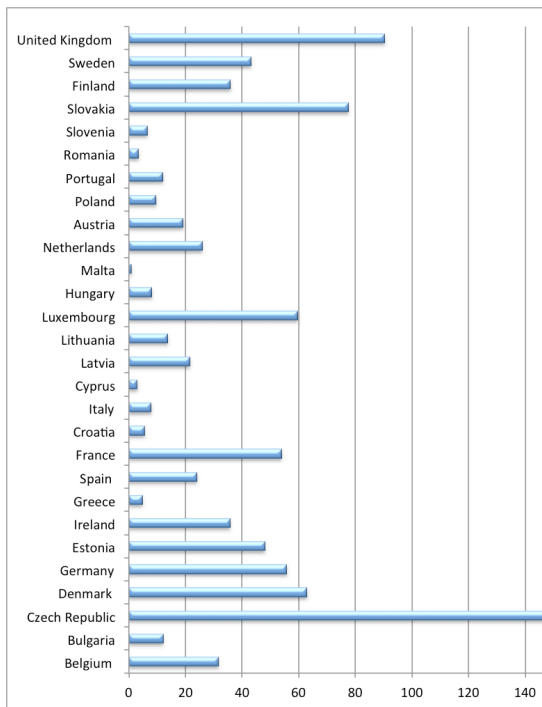


Fig. 1a The average area of holdings (hectares) in European Union (2010)

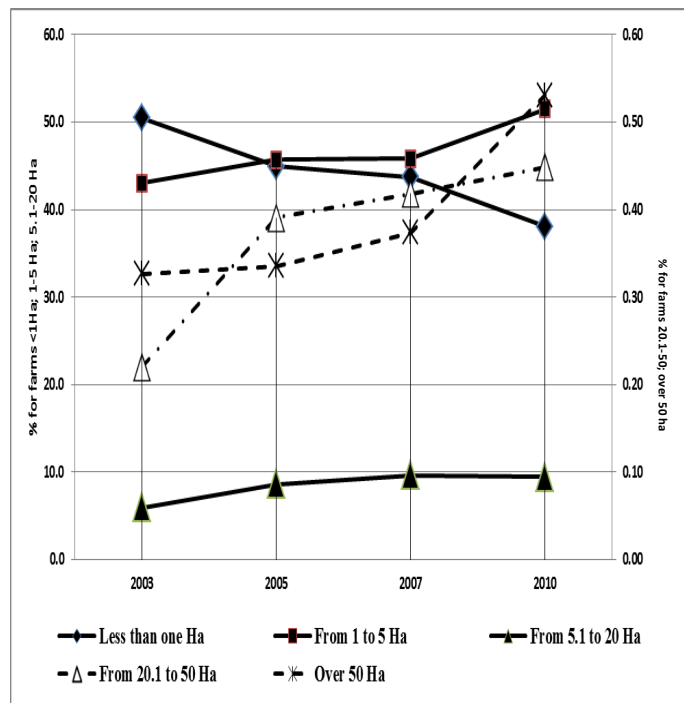


Fig. 1b The share of the farm numbers in different farm size classes (comparatively 2003 – 2010).

Source: Eurostat, 2013

Table 2. The concentration analysis for the single holder farmers

	2003				2005				2007				2010			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Romania (total)	0.67	0.39	72.7	26.3	0.63	0.35	67.3	21.3	0.63	0.35	65.5	20.1	0.69	0.3	74.6	23
North-West	0.65	0.44	67.5	24.5	0.6	0.37	60.9	18.7	0.56	0.38	55.1	15.3	0.64	0.35	65.4	19.9
Centre	0.63	0.39	70.4	22.4	0.57	0.29	61.0	13.6	0.58	0.31	59.9	14.3	0.61	0.24	67.2	15.0
North – East	0.71	0.49	73.9	34.8	0.68	0.47	70.2	31.0	0.66	0.43	67.1	26.9	0.74	0.39	77.3	32.6
South – East	0.69	0.33	74.9	22.7	0.63	0.28	68.8	18.4	0.60	0.13	69	17.9	0.62	0.18	79.8	19.3
South–Muntenia	0.74	0.41	82.0	34.9	0.72	0.43	77.6	32.0	0.71	0.39	76.4	0.39	0.79	0.33	85.8	31.9
Bucharest	0.84	0.44	91.8	44.9	0.72	0.41	84.6	34.3	0.76	0.43	89.1	42.6	0.8	0.4	94.1	43.4
South – West	0.63	0.47	66.6	26	0.59	0.4	60.5	20.2	0.6	0.43	61.1	21.4	0.65	0.39	69.3	25.1
West	0.58	0.33	62.4	12.1	0.56	0.29	59.5	10.7	0.55	0.3	55.9	9.32	0.59	0.26	63.7	11.3

(1) Gini – Struck coefficient for the farm number; (2) Gini-Struck coefficient for the utilized agricultural area; (3) % of farms less than 2 hectares. (4) % of UAE in farms less than 2 hectares.

Source: own processing data

For the agricultural holdings there is a strong concentration of utilised agricultural area in big farm sizes (over 100 hectares). They are the main CAP payments beneficiaries from the first pillar.

Table 3. The concentration analysis for the agricultural holdings

	2003				2005				2007				2010			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Romania (total)	0.32	0.97	22.7	0.04	0.33	0.96	18.9	0.04	0.35	0.96	15.6	0.04	0.31	0.94	28.3	0.09
North-West	0.27	0.96	27	0.07	0.26	0.95	24	0.08	0.26	0.95	18.1	0.06	0.26	0.90	29	0.15
Centre	0.25	0.96	24.7	0.05	0.25	0.94	20.9	0.06	0.27	0.95	15.5	0.03	0.28	0.92	32	0.13
North – East	0.28	0.95	27.6	0.08	0.28	0.95	23	0.08	0.29	0.95	19.3	0.07	0.32	0.94	31.4	0.13
South – East	0.47	0.98	16.2	0.02	0.48	0.97	9.7	0.01	0.52	0.97	8	0.02	0.43	0.96	18.4	0.03
South – Muntenia	0.45	0.97	21.2	0.03	0.47	0.97	18.1	0.03	0.48	0.97	15.6	0.03	0.39	0.96	33.3	0.09
Bucharest	0.37	0.96	24.4	0.05	0.47	0.97	14.8	0.02	0.48	0.97	14.3	0.02	0.38	0.94	18.2	0.08
South – West	0.37	0.97	20	0.03	0.33	0.95	17.9	0.06	0.34	0.94	14.2	0.06	0.31	0.94	20.5	0.08
West	0.31	0.97	18.8	0.03	0.32	0.97	18.8	0.03	0.33	0.97	15.3	0.03	0.27	0.95	26.9	0.07

(1) Gini – Struck coefficient for the farm number; (2) Gini-Struck coefficient for the utilized agricultural area; (3) % of farms less than 2 hectares. (4) % of UAE in farms less than 2 hectares.

Source: own processing data

The Analysis of Productivity Gains in Romanian Agriculture after the EU Accession

The Total Factor Productivity index (TFP) analysis can be split in two periods of time. Between 1999 and 2007 the productivity had an oscillatory movement being extremely dependent on the atmospheric conditions (precipitations). After 2007 the variance is less important even if there were years with extreme drought (2012). However the Productivity index was very low (below 0.5% per year) but it has an increasing trend (Fig. 2).

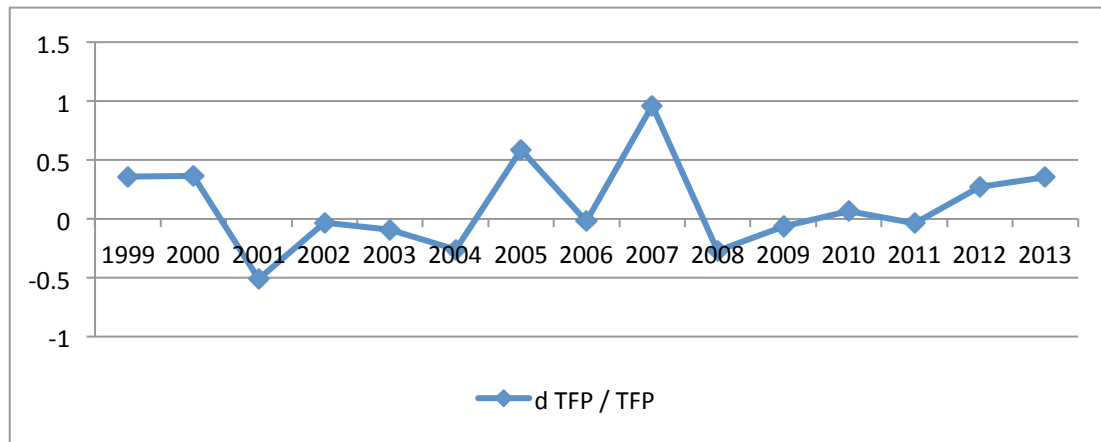


Fig. 2 The evolution of Total Productivity Gains in Romanian Agriculture (1999 – 2013)

Source: own processing data

Conclusions

The analysis of the Romanian agricultural structures shows that the land and the farms are very concentrated accordingly to the juridical status. The single farm holders remain concentrated in small size classes that make them ineligible for different types of CAP payments. On the other hand the agricultural holdings are concentrated in big farm sizes classes. They are the main beneficiaries of the CAP financial allocation. Even if the agricultural budgetary expenses increased after Romanian joining to the EU the Total Factor Productivity index remains extremely weak but it is less sensitive to the agro-environmental conditions.

References

1. Boussemart, J-Ph., Butault J.P., Ojo O. (2012). Generation and distribution of productivity gains in French agriculture. Who are the winners and the losers over the last fifty years? Bulletin UASVM.Horticulture 69(2):55-67.
2. Csaki, C., Jambor, A. (2013). Impacts of the EU enlargements on the new member states agriculture. Acta Oeconomica et Informatica. 1: 35-50.
3. Davidova, S., Fredriksson L., Bailey A. (2009). Subsistence and semi-subsistence farming in selected EU new member states. Agricultural Economics 40(1):733-744.
4. Henle, K., Alard D., Clitherow J., Cobb P., Firbank L., Kull T., McCracken D., Moritz R.F.A, Niemelä J., Rebane M., Wascher D., Watt A., Young J. (2008). Identifying and managing the conflicts between agriculture and biodiversity conservation in Europe – a review. Agriculture, Ecosystems & Environment. 124:60–71.
5. Kazukauskas, A.; Newman C., Clancy D.; Sauer J. (2013). Disinvestment, farm size, and gradual farm exit: the impact of subsidy decoupling in a European context. American Journal of Agricultural Economics. 95(5):1068 – 1087.

6. Kazukauskas, A., Newman, C., Sauer, J. (2013). The impact of decoupled subsidies on productivity in agriculture: a cross-country analysis using microdata. *Agricultural Economics* 45(3): 327-336.
7. Key, N., Roberts M. (2007). Do government payments influence farm size and survival ? *Journal of Agricultural and Resource Economics*. 32(2):330–349.
8. Piet, L., Latruffe L., Le Mouel C., Desjeux Y. (2011). How do agricultural policies influence farm size inequality? The example of France. *European Review of Agricultural Economics*. 39(1):5–28.
9. Sahrbacher, A. (2012). Impacts of CAP reforms on farm structures and performance disparities: An agent-based approach (No. 65). *Studies on the agricultural and food sector in Central and Eastern Europe*: 226-228.
10. Spicka, J. (2013). The Economic Disparity in European Agriculture in the Context of the Recent EU Enlargements. *Journal of Economics and Sustainable Development*, 4(15): 125-133.
11. Suchoń, A., Baum, R. (2013). Lease of agricultural land as an instrument of structural changes in agriculture in the context of the theory of institutional economics. *Acta Scientiarum Polonorum. Oeconomia*. 12(4).
12. Thomson, K.J. (2014). Current EU Policy Treatment of Small and Semi-subsistence Farms. *EuroChoices*. 13(1):20-25.
13. Viaggi, D., Raggi M. (2011). Understanding the determinants of investment reactions to decoupling of the Common Agricultural Policy. *Land Use Policy* 28(3): 495-505.
14. Yao, S. (1997). Decomposition of Gini coefficients by income factors: a new approach and application. *Applied Economics Letters*. 4(1): 27-31.
15. Yee J., Ahearn M. (2005). Government policies and farm size: does the size concept matter? *Applied Economics*. 37(19):2231–2238.
16. Zier, P. (2013). Econometric impact assessment of the Common Agricultural Policy in East German agriculture (No. 71). *Studies on the Agricultural and Food Sector in Central and Eastern Europe*: 118-123.
17. *** European Commission, 2014, Farm economy focus: Hungary, http://ec.europa.eu/agriculture/rica/pdf/FADN_FEF_2012_HU.pdf
- 18.***Eurostat, 2013, Agriculture, forestry and fishery statistics, http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-FK-13-001/EN/KS-FK-13-001-EN.PDF
19. ***Eurostat, 2013, Agriculture, forestry and fishery statistics, http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-FK-13-001/EN/KS-FK-13-001-EN.PDF
20. ***Romanian Institute for Statistics, 2014, Tempo Online Database.