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## First effects of CAP greening at Polish farms

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Paper prepared for presentation for the 162<sup>nd</sup> EAAE Seminar  
*The evaluation of new CAP instruments: Lessons learned and the road ahead*

April 26-27, 2018  
Corvinus University of Budapest  
Budapest, Hungary

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## Introduction

For over twenty years the Common Agricultural Policy (CAP) has been the subject of successive reforms aimed at increasing market orientation of agriculture, at the same time providing income support for farmers, increasing the requirements of environmental protection and taking action to accelerate the development of rural areas across the EU. One of the essential elements of the last reform is the concept of the CAP greening. At the farm level greening aims at supporting “agricultural practices that are beneficial to the climate and the environment”, however, as emphasized by Louhichi et al (2017), up taking of the policy measures and its results depend largely on farm characteristics.

Relatively short time that has passed since the implementation of the last reform does not allow for collecting sufficient data needed to fully evaluate environmental effects of the greening because they can reveal rather in the long run. It is already possible, however, to carry out some analyses of changes that took place in farms after the implementation of the reform.

Majority of earlier evaluations of the „greening” was usually carried out with the use of aggregate models based on strong assumptions regarding farmers’ behavior, since farm-level empirical evidences were rather limited (Louhichi et al 2017). Model analyses carried out by various authors were indicating, *inter alia*, a reduction of agricultural incomes in the short run and increase of production costs in the long run (Matthews 2012), reduction of production and increase in prices of agricultural products (Cantore 2013). Gocht et al. (2016) showed a slight reduction in farm productivity driven by the land reallocation effects of greening measures, and a small increase of farm income due to price increase effects offsetting the production decrease. For Poland the impact of „greening” was analyzed e.g. by Czekaj et al. (2013) or Was et al. (2014) who anticipated some changes in cropping structure (especially in monoculture and duo-culture) and decline of farm incomes. It is worth to underline that due to significant fragmentation of the farm structure in Poland (more than 50% share of farms below 10 ha of agricultural land) a large number of small farms has been excluded from the “greening obligation” (Wąs, Jaroszewska 2017a). According to Central Statistical Office statistics (CSO 2017) share of such farms can reach 70% of total farms number, however the share of arable land excluded from greening does not exceed 25,5% (table 1).

**Table 1.** Number of farms and area of arable land in farms regarding the CAP greening requirements

Classification	Farms		Arable land	
	number	%	Area [ha]	%
Total	1 235 137	100	10 887 020	100
Farms < 10 ha of arable land - exempted	900 132	72,9	2 780 962	25,5
Farms > 10 ha of arable land – crop diversification required	335 005	27,1	8 106 058	74,5
Farms > 15 ha of arable land – crop diversification and EFA required	197 697	16,0	6 832 943	62,8
5 % of area to be designated for EFA			341 647,15	3,1

Source :Wąs A. Jaroszewska J. (2017a)

In the population of farms under FADN observation not more than 57% of farms were exempted from the implementation of the greening requirement, within the range from 36% of crops and pig farms to 61% of cattle farms. In addition, in the whole FADN population 23% of

farms were fulfilling already the “greening criteria” before the reform implementation. Even there are some differences between the CSO and FADN data it can be stated that only a small part of farms’ population in Poland was not adjusted to “greening requirements” before the reform implementation, although the mechanism of “greening” applicable to a large area of arable land operated by large scale farms.

Table 2. Direct payments rates and financial envelopes for 2014 and 2015 in Poland

Types of direct payments	2014 financial envelope [mln PLN]	Rates of payments for 2014	Types of direct payments	Financial envelope for 2015 [mln PLN]	Rates of payments for 2015
Single Area Payment (SAP) [PLN/ha]	12859.4	910.87	Single Area Payment (SAP) [PLN/ha]	6 414.68	453.7
			Greening payment [PLN/ha]	4 302.45	304.31
			Additional payment [PLN/ha]	1 190.34	170.22
			Young farmer payment [PLN/ha]	282.80	258.97
Cow payment [PLN/head]	190.50	595.3	Cattle payment [PLN/head]	729.23	261.37
			Cow payment [PLN/head]	644.89	314.28
Sheep payment [PLN /head]	8.03	125.32	Sheep payment [PLN/head]	19.76	116.56
			Goat payment [PLN/head]	1.13	77.8
Special legume payment [PLN/ha]	125.33	556.37	Special legume payment [PLN/ha]	286.83	415.21
Complementary hops cultivation payment (decoupled) [PLN/ha]	2.11	1 000.39	Hops payment [PLN/ha]	3.55	2 311.32
Complementary starch payment (decoupled) [PLN/ha]	36.09	351.69	Starch potato payment [PLN/ha]	36.78	1 387.12
Separate sugar payment [PLN/tonne]	665.88	53.61	Sugar beet payment [PLN/ha]	344.68	2 138.45
Separate fruit and vegetable payment (tomato) [PLN/t]	28.05	165.55	Tomato payment [PLN/ha]	17.88	4 272.62
Separate soft fruit payment [PLN/ha]	46.12	1 569.76	Separate soft fruit pavement [PLN/ha]	63.67	927.65
Special aid for tobacco producers	121.30		Flax payment [PLN/ha]	2.42	411.92

Source: own elaboration based on data of Agency of Restructuration and Modernization of Agriculture (ARMA)

Despite the repeated demands for simplification of the agriculture support system under the CAP, its partial decentralisation made it less transparent and more difficult to handle for third parties. Using possibilities given by the EU the Polish government together with introduction of the greening of the CAP decided to introduce number of the new instruments, which were also affecting organization and economic performance of farms (table 2).

The available statistical data (CSO 2017) allow to state that some effects of implementation of greening reform can be observed mainly in farms with an agricultural area above 15 hectares. It shows also that in the next year after greening the reduction of the fallow land area could be observed. This results with the increase of the total sown area, particularly the increase of the area of protein crops (Was, Jaroszewska 2017b).

It should be underlined, however, that protein crops were eligible for an additional payments also under previous CAP. Although current policy scheme introduced new additional, strong incentive for their cultivation. Farmers by growing proteins can fulfil other greening requirements, which is delimitation of Ecological Focus Area. In general, because the protein crops have rather marginal share at national level the scope of these changes is rather small what suggests that the effects of greening on a country level are rather negligible so far. It should be pointed that statistical data published by the CSO do not provide any information on crop diversification nor an insight into characteristics of various groups of farms with a different influence of the “greening”.

Assessing impact of greening on various types of farms seems to be an important challenge from the point of view of desired structural changes in Polish agriculture. Thus the main aim of the paper was to identify and assess the impact of the CAP greening on organization and financial results of farm types differentiated by the size regarding requirements included in the reform.

## **Methodology**

Impact of the reform was analyzed by investigating the relations between specified parameters in farms divided into four area categories (< 10ha, 10-15 ha, 15-30 ha, > 30 ha). Farm size classes were chosen in line those introduced in CAP greening requirements.

The data has been presented for the years 2011 - 2015. However the period analyzed covers actually only year before reform(2014) and one year after reform (2015). The 2015 is the first year of FADN results after introduction of new CAP requirements. It is important to notice that in the year 2013 the FADN sample was adjusted (Figure 1). In the considered period (2014-15) the structure of the FADN sample remained stable.

The study was based on a sample of farms under Polish FADN (Farm Accountancy Data Network). The single farm records from analyzed period has been analyzed. Value of indices has been calculateated with use of information of number of represented farms (SYS 02 variable), thus the values represents whole FADN population.

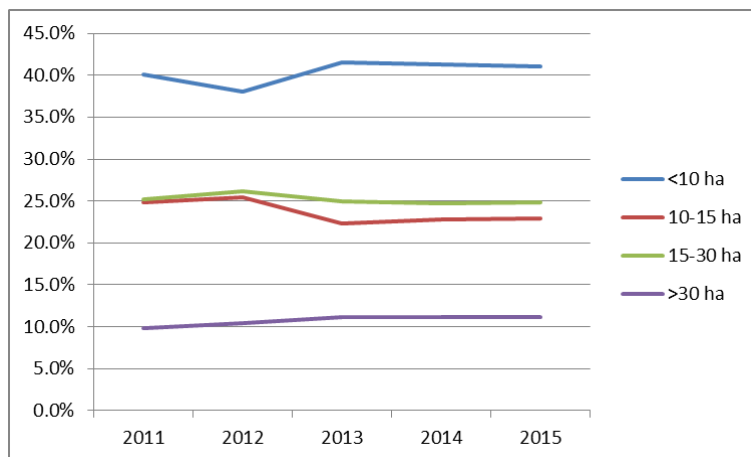


Figure 1 Structure of FADN population by farm size classes

The absolute values of the indices of farm performance might change even in short period due to other factors than CAP reform. This is specially valid in case of agriculture which is dependent on climatic and market factors. To eliminate impact of other than CAP reform factors the values of analyzed indicators, for each of farm cluster, were analysed in relation to average values of in the total sample for each of considered years.

## Results

Even the structure of FADN population in considered period was stable the decrease of average size in the biggest group of farms is observed. One of the reasons of this change (Figure 2) might be division of the biggest farms.

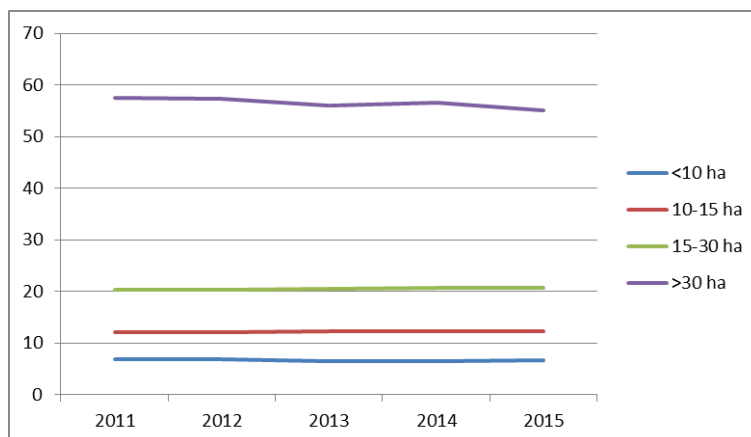


Figure 2. Changes of average farm size in considered farm size clusters (own elaboration based on FADN database).

Modulation of the direct payments, introduced first time in 2009 with phasing in period till 2012, significantly reduced the support for the biggest farms limiting its value to 150.000 EUR/farm, thus facilitating decrease of size of the biggest units (table 3). Thus this change should not be perceived as an effect of latest CAP reform.

Table 3. Structure of farms in Poland 2010-2016

Farm size cluster [ha]	2010		2013		2016	
	Number of farms	Area [ha]	Number of farms	Area [ha]	Number of farms	Area [ha]
1-30	1498337	9252759	1322076	8534645	1312729	8380979
30-200	57548	3167384	68177	3855634	70753	3095235
200-500	2132	620162	3237	977128	3427	1013383
500-1000	330	219129	831	566534	758	517271
1000 and above	66	144656	311	646047	270	509666

Source: CSO 2010, 2016 The Characteristics of Agricultural Holdings

It needs to be pointed here that average farm size in FADN population, which covers 90% of total agricultural production is 19,5 ha (FADN 2016) and is higher than national average, which is 10,3 ha (CSO 2016).

One of the most important for the Polish farmers requirements introduced by the CAP reform was obligation of introduction of Ecological Focus Area at level of 5% of arable land [Wąs A. ed 2013]. This was obligatory for farms above 15 ha of arable land. It was expected that this will increase area of fallow land, especially in the bigger farms. It could be observed in the FADN data (Figure 3).

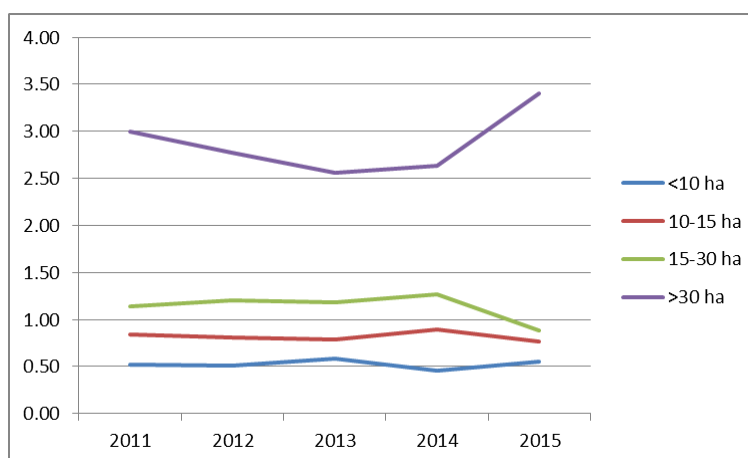


Figure 3 Area of fallow land area in farm size clusters [1= FADN avg. ~0,3 ha /farm in 2015]

It should be noticed that in the biggest farms the relative area of fallow land increased, while in the small and medium farms its share decreased. On average, the area of the fallow land almost did not change in the FADN population. It might be concluded that most of farmers preferred to use EFA equivalents like growing proteins (1 ha of protein crops = 0,7 ha of EFA) or growing catch crops (1 ha of catch ~ 0,3 ha of EFA) instead of introduction of set-aside.

Another new CAP requirement was diversification of crops on the farm. Previous studies did not report that it was an important constraint in case of Polish farms (Góral J. ed. 2014). Most of farmers comply with this requirement as the crop definition used in this measure is very favorable for farmers as definition of crop (eg. spring and winter wheat are considered as two different crops).

Even the crop diversification is not considered as a challenge in relation to the newest CAP reform the dominating share of cereals in cropping structure in Poland was often discussed as a problem in this context. The figure 4 shows decreasing share of cereals in the cropping structure. However only small part of this change could be ascribe to the CAP greening.

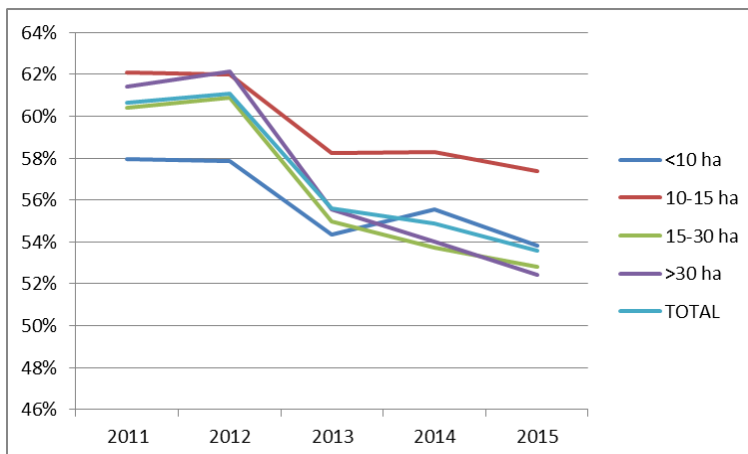


Figure 4 Share of cereals in cropping structure in FADN farms.

The payments for operational activities in Polish farms used to depend mostly on the area of farm. However coupled payments introduced together with CAP greening has slightly changed this situation. In number of new measures farmers were eligible for payments only for certain scale of activities. Additional payment for arable land is eligible only for farms between 3-30 hectares, payment for cows and cattle for 3-30 animals. Similarly in case of sheep and goats payments. Those payments were designed to provide higher support of small and medium farms. However in the case of the smallest farms (<10 ha) (figure 5) the average sum of payment received per farm in 2015 was relatively lower comparing with 2014. Many of those farms were too small to reach the threshold entitling for those coupled payments (e.g 3 hectares, 3 cows, 3 heads of cattle ect.), while suffered due to reduction of basic payment rates (table 2, 2<sup>nd</sup> row). Decrease of basic payment rates and limited eligibility to coupled payments are also the main causes of decrease of payments level in the biggest farms in 2015.

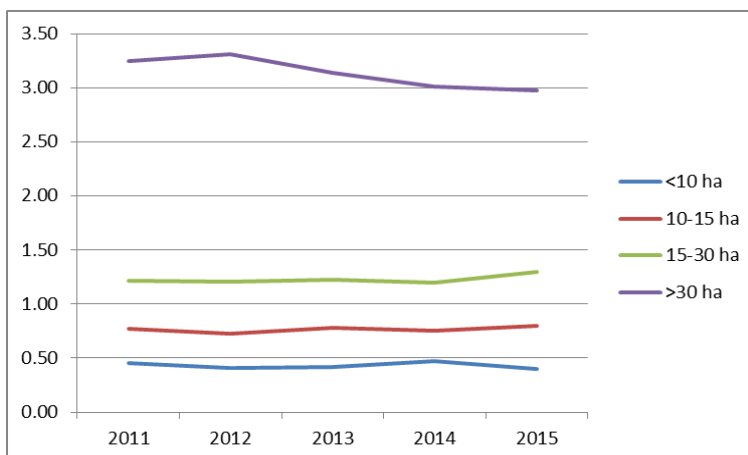


Figure 5 Payments to operational activities per farm [1.00=FADN avg.~ 1276 PLN/ha in 2015]



Decrease of cereals in cropping structure between 2014 and 2015 is rather small (less than 1 percentage point) however it should be noticed that it is observed mostly in farms over 30 ha and 15-30 ha, while in farms of 10-15 ha was rather negligible. As one of the reasons for decrease share of cereals might be growing share of protein crops supported by additional payments and allowing to fulfil EFA requirements.

Even the payments received by the smallest farms decreased in year 2015 compared to 2014 farmers were able to generate higher production per hectare (Figure 6). It seems that there are no premises to connect this change with CAP reform. It is rather continuation of trend resulting from more intensive organization of production and development of additional activities (e.g. agritourism) in some of small farms.

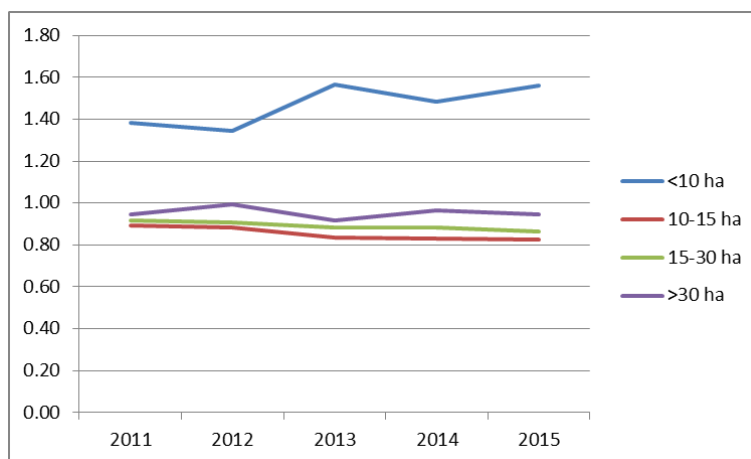


Figure 6 Value of agricultural production per ha [1.00 = FADN average~6309 PLN/ha. in 2015]

Value of agricultural production per hectare in remaining farm size clusters was in 2015 on nearly the same level as in 2014. It should be noticed that in farms above 10 hectares value of agricultural production per hectare is dependent on the size of farms. The bigger the farm is the higher production per hectare is observed.

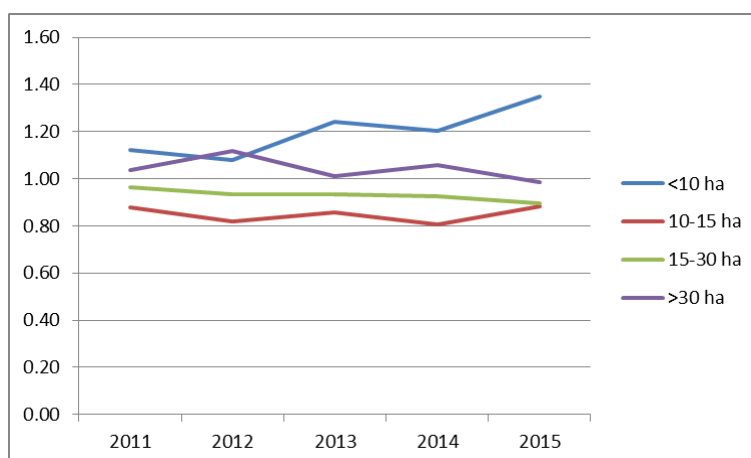


Figure 7 Farm income per hectare of arable land [1.00= FADN avg. ~ 1705 PLN/ha in 2015]

Observed changes in farm income (Figure 7) could be explained based by changes in production value and amount of received support. Increase of farm income per 1 hectare of

agricultural land in the smallest farm size cluster reflects mostly increase of production value, as payments in this farms group remained stable in whole observed period. Even the production in bigger farms remained unchanged just after the reform some changes in farm income could be noticed. This is the result of changes in level of support. Even the changes are not significant it could be noticed that in farms of 10-15 hectares the average farm income is increasing. In the same time in farms over 30 ha farm income is decreasing.

Value of farm income per farm depends on the farm income per hectare and the size of the farm. Area of the small farms (< 10 ha and 10-15 ha) remained unchanged so the increase of income per hectare results in higher income at the farm scale (figure 8).

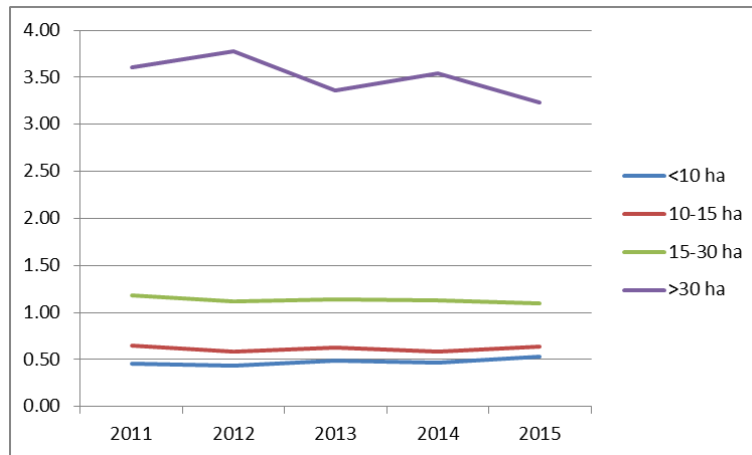


Figure 8 Farm income per farm [1.00=FADN average ~ 33 th. PLN/farm in 2015]

However in the group of biggest farms in which area and the payments were decreased a drop of farm income could be observed. In 2014 farms above 30 ha used to have farm income 3.5 higher than average FADN farm, while after CAP greening they got only 3.25 of average.

## Conclusions

Due to the short observation period the scope of the analysis is rather limited, although some interesting conclusions have been drawn:

- The value of direct payments per 1 hectare has declined in the group of farms <10 ha, while an increase was noted in farms between 10-30 ha.
- Although the smallest farms (<10 ha) have been exempted from the greening requirements they lost part of payments as there were in some cases too small to be eligible for the redistributive payment (3-30 hectares) and voluntary coupled payments (eg. for herds from 3 to 30 cows).
- The total average value of the operational payments per farm decreased mostly in the biggest farms (>30 ha). It is supposed that it is caused by dividing the biggest farms into smaller units in order to avoid topping up of the payments. Some changes have been also observed in the structure of production (e.g. decrease of cereals' share in the sowing area).
- The average area of fallow land in FADN population remain unchanged, however its share increased in the farms above 30 ha, strongly decreased in farms of 10 to 30 ha and remain unchanged in farms smaller than 10 ha.
- The farm income per farm increased in the farms below 15 ha, remained unchanged in farms of 15-30 hectares and slightly decreased in group of the biggest farms (> 30 ha).

- In case of medium farms (10-15 and 15-30 ha), the additional incomes from increased payments compensated costs of adjustments.
- Decrease of farm income in case of biggest farms (> 30 ha) results from decrease of average farm size, slight increase of fallow land area and reduced payments rate per hectare (due to introduction of voluntary coupled support, redistributive and the young farmer payments)

The comparison of observable changes in farms' characteristics generally confirm earlier predictions based on different model analysis. It should be concluded that the impact of "greening" on Polish farm sector is rather small.

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