



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.*

Ryszard Kata, Dariusz Zajac

University of Rzeszow, Faculty of Economics, ul. M. Ćwiklińskiej 2, 35-601, Poland
rdkata@univ.rzeszow.pl; dzajac@univ.rzeszow.pl

The impact of farmers' relationships with the institutions on the income of agricultural holdings in Poland

Abstract: *The article presents results of the survey on farmers relations with institutions in Poland. The main purpose of this study is to outline correlation between agricultural holdings income and their relationships with the institutional environment. Findings showed that accessing the European Union by Poland contributed to the intensification of farmers' relations with institutional surroundings. A considerable and growing participation of the state aid is being recorded in agricultural holdings' income, mainly in the form of European Union subsidies. The conducted research showed that the level and intensity of the farmers' relation with the institutions influence income of agricultural farms.*

Keywords: *income of agricultural holdings; institutions; farmers*

Introduction

Providing Polish farming with the union's common agricultural policy (CAP) exerted a positive effect on farmers' incomes in Poland. In 2004 they grew 2.1 times comparing to the average from the years 2001-2003, and in next years had also indicated a slight upturn. It was first of all an effect of the rise in subsidies. Their share in the income of farms rose around a little bit over 9% to almost 39% in 2004, and to 52% in 2006. In the structure of subsidies, the European Union (EU) subsidies constitute the straight majority.

However, the statistical data shows that income benefits from the union support are not allocated evenly, but in the large degree concern agricultural holdings which are of big areas and are strong economically, having also the long-lasting relations with the market (ARiMR 2007). It should be also assumed that the level of farmers' participation in supporting the income is a consequence of their activity in relations with the institutional surroundings. Using relief programmes requires considerable knowledge; especially finan-

cial, legal, technological or ecological. Unaided from the side of institutional surroundings, farmers are not able to manage with all requirements associated with the European Union financing (Kata 2008).

Farmers through the relations with institutions can therefore reap benefits on account of the political pension (through subsidies, subventions or market protectionism), but also benefits from the title of the economic pension, through the efficiency increase of the business activity, as the result of the institutional support in the area of implementing innovation, processes of cooperation and integration in the farming, or within the scope of sale and marketing.

Methodology

The primary goal of the study is to determine the relation between profits of agricultural farms and their relations with institutions. The thesis that income from agricultural holdings is increasingly dependent on the relations of farmers with institutions will be verified. These institutions are understood here as formal organizations.

A questionnaire survey conducted in the form of the questionnaire interview with farmers from the region of south-east Poland will be the source of the empirical data. The survey was carried out in the first half of 2007 on a randomly chosen sample of 856 farmers - owners of individual farms.

For the purpose of the research, the synthetic coefficient of intensity of the farmers' relation with institutions (W_i) was introduced. Construction of this parameter is based on a point scale used to evaluate farmers' relations with institutions. For each institution a farmer had a relation with 1 point was graded, additionally points from 1 to 5 were awarded according to frequency of such relations (1 point - occasional; 5 points - regular). Next, standardization of obtained point values was carried out, i.e. the biggest value of a measuring instrument within the observation under research was given the value of 1, afterwards, the values of the other observations were divided into the biggest value of the measuring instrument (the one with 1) and as result the W_i coefficient was possible to be presented in a scale from 0 to 1. Value 0 - meaning lack of any relations with institutions and 1 - maximum, in a researched community, intensity level of relations with institutions.

Results

856 individual agricultural holdings took part in the questionnaire survey, they were selected by means of the quota sampling method so that the research trial reflected the structure of the entire community of farms in the macro-region of the fragmented farming. For the base of the selection an area of agricultural lands was accepted, dividing in this way the sample into three groups, i.e. farms up to the area of 5 ha of agricultural land (AL), farms from 5 to 10 ha and farms above 10 ha. Additionally, at the stage of the selection of individuals

for the sample, also a group of agricultural holdings not using direct payments from the EU was distinguished. These are individual agricultural holdings, which “statistically” are being classified as agricultural holdings, but in fact they are “inanimate” in the aspect of conducting agricultural production for the purposes of market. Out of the examined community of agricultural holdings, these holdings demonstrate the weakest economic strength (expressed in ESU) and the smallest average area of agricultural land (Table 1).

Table 1. The characteristics of the examined agricultural holdings (the state for end 2006)

Specification	The examined agricultural holdings*				
	In total	N	Z		
			I	II	III
Number of agricultural holdings	856	136	329	248	143
Average economic size of farms in ESU (European Size Unit)	8.0	0,8	4.4	9.4	20.8
Average area of agricultural land (ha)	7.9	2,0	3.7	7.7	23.6

*Commentary to the table: N - agricultural holdings not using the EU direct subsidies, Z- agricultural holdings using direct payments from the EU, including the area groups:

I- from 1 up to 5 ha (AL),

II – 5 - 10 ha,

III – above 10 ha.

Source: questionnaire survey

Agricultural holdings examined in the questionnaire survey are strongly diversified in terms of the value of market output (Table 2). The value of market output in a farm on the whole and per 1 full-time employee (1 AWU - Annual Work Units), visibly grows at the same time with the increase in economic power and the area of an agricultural holding. It is definitely lowest in the group of agricultural holdings not using the EU direct subsidies (weakest economically and of smallest area). However, it is the highest in the group of agricultural holdings above 10 ha, i.e. strongest economically and of biggest area (Table 2).

The consequence of differences in the value of market output, proving the production potential of an agricultural holding and its connection with the market, there are differences in income coming from an agricultural holding (Table 2). Its level, calculated per one full-time employed person in a farm, is definitely the lowest in the group of agricultural holdings not using the EU direct payments. In groups of agricultural holdings using subsidies it is much higher, but it significantly increases together with the increase of an agricultural holding's area, achieving the definitely high level in the group of units above 10 ha (of AL). It is also interesting that along with the growth of the agricultural holding's area the percentage of units which recorded a loss on account of the agricultural activity is reducing. On the other hand, the increase can be noticed when the participation of union subsidies in the structure of agricultural holdings' income is concerned (Table 2).

Table 2. The market output and income of agricultural holdings in 2006 (in PLN)

Specification	Examined agricultural holdings *				
	In total	N	Z		
			I	II	III
1. Value of goods production on the whole (in PLN)					
- per 1 agricultural holding	49 106.6	3 947.6	23 172.8	54 803.6	141 840.9
- per 1 ha of AL	6 154.9	1 988.1	6 277.5	7 149.4	5 889.4
- per 1 full-time employed person (AWU)	35 116.6	4 511.6	17 715.5	33 876.6	82 295.0
2. Income from an agricultural holding					
- per 1 agricultural holding	25 753.0	179.9	11 748.6	29 041.3	76 591.5
- per 1 ha of AL	2 615.1	90.6	3 179.5	3 788.6	3 180.2
- per 1 full-time employed person (AWU)	19 254.3	202.2	8 878.6	17 907.1	44 437.8
3. Percentage of agricultural holdings with the loss	20.6	61.8	17.9	10.5	4.9
4. Participation of the EU subsidies in agricultural holding's income	44.4	0.0	47.3	50.0	66.5

*Comments as in Table 1

Source: questionnaire survey

Presented results suggest that a positive relation appears between the income from an agricultural holding and such features of farms as: value of market output, area of a farm and economic strength expressed in ESU. This issue will be a subject to the statistical verification further. Apart from that, also interesting may appear establishing the interrelation between the analyzed economic parameter and the relations of farmers with institutional surroundings.

Results of the questionnaire survey show the empirical distribution of the examined community of agricultural holdings in the aspect of the number and kind of institutions with which farmers were in contact (Table 3), and frequency of these relations - from occasional to permanent (having character of the long-lasting cooperation). Majority of farmers (ca. 90%) cultivate their relations with the agricultural consulting and banks. The high percentage of farmers also holds relations with the local government, especially with a self-government of the commune (87.9%), whereas less than 80% with Agency for Restructuring and Modernisation of Agriculture (ARMA). For nearly 60% of farmers relations with the bank have the character of permanent contacts, however permanent contacts from Agricultural Advisory Centre (on different levels of consulting) declared 51.8% of agricultural holdings' users (table 3). Relations with the remaining agricultural agencies: Agricultural Market Agency (AMA) and Agricultural Property Agency (APA) holds appropriately 31.3% and 15.2% of farmers, but permanent relations (more often than once per three months) holds a very little percentage of farmers. The similar situation concerns the relation of farmers with employment offices, with farmer's fair (with wholesale market), with associations or trade organizations, with which every tenth farmer is in contact with, but in the straight majority this contact is occasional (incidental).

Table 3. The structure of agricultural holdings according to the frequency of relations with the institutions

Institution	Percentage of farmers declaring the relations		Institution	Percentage of farmers declaring the relations	
	In total	permanent		In total	permanent
Agricultural Advisory Centre	90.5	51.8	District Employment Office	12.6	1.9
Bank	90.0	58.6	Agricultural fair (wholesale market)	10.7	2.3
Self-government of the commune	87.9	31.1	Associations	9.9	4.1
Agency for Restructuring and Modernisation of Agriculture (ARMA)	78.4	17.6	Trade organizations	7.7	1.3
Self-government of the district	55.1	4.0	Research and development centres	6.8	0.6
Agricultural chamber	48.8	1.4	Centres of supporting the entrepreneurship	6.5	0.2
Agricultural Market Agency (AMA)	31.3	2.9	Trade union of farmers	6	0.6

Source: questionnaire survey

Generally, there is a very low level of the participation of farmers in relations with organizations associating farmers and rural inhabitants, as well as with research institutions and special institutions of certification and control of the quality of production, supporting the transfer of new technologies and the HRD (Human Resources Development) in the country. Also, the relations with institutions from the sphere of market are weak, including financial and insurance institutions. Admittedly, the relations with the bank declared 90% of farmers, but only every third of them uses loan products (including 17.3% of the investment credits).

Analysis of the structure of agricultural holdings within the scope of forms of assistance of institutions (Table 4) clearly shows that holdings applying for direct payments used first of all the support in gaining the financial means from the EU. Many farmers used also the consulting and trainings which often concerned the EU funds. There were no important differences in the mentioned spheres among groups of farms applying for direct payments. However, differences in favor of bigger agricultural holdings concerned the other forms of assistance of institutions.

Users of agricultural holdings with the area above 10 ha of agricultural land much more often than farmers from the remaining groups used help by applying for EU funds for financing investments, as well as from other external financial supplies and the support in the sale and marketing, also introducing innovations.

Farms not applying for direct payments, having very weak and occasional contact with institutions, practically did not use any of the forms of assistance. Only 14% representatives of this group gaining support in the aspect of consulting and trainings, mainly connected with the career advice.

Table 4. The percentage of agricultural holdings using various forms of assistance from the institutions

No.	The form of the support	% of agricultural holdings according to groups *			
		N	Z		
			I	II	III
1.	Help in acquiring financial means from the EU	3.7	75.1	82.7	87.5
2.	Consulting, consultancy, trainings	14.0	74.8	80.5	82.1
3.	Preparing investment projects, development plans of farms, etc.	3.7	31.6	48.7	62.8
4.	Financial assistance (credit, loan)	2.2	28.9	43.2	65.9
5.	Implementing new technologies, products, services	2.9	21.0	32.4	42.9
6.	Help in preparing the loan application	1.5	19.3	23.7	46.4
7.	Help in sale and marketing (promotion, integration supporting and cooperation)	2.2	10.3	18.0	27.4
8.	Planning, organization and managing the agricultural or non-agricultural production	0.7	5.3	15.1	22.1
9.	Certificating, control systems and providing the quality	0.0	3.9	8.2	10.1
10.	Other (e.g. help in enlarging an agricultural holding)	1.2	2.2	1.9	4.2

*Comments as in Table 1

Source: questionnaire survey

For illustrating the interrelation between farmers relations with institutions and income from the agricultural holdings, a synthetic coefficient of intensity of the farmers' relations with institutions was compiled (W_i). The value of this parameter is located in a range from 0 to 1. The average value of this synthetic coefficient for the whole community (0.41) shows low level of intensity of farmers' relations with institutions along with moderate level of diversity of the community under research in this respect (variation coefficient 46.4).

Table 5. The statistics of the coefficient of intensity of the farmers' relation with institutions (W_i)

Specification	Coefficient W_i		
	Arithmetic mean	Standard deviation	Coefficient of variation (V)
1. Farmers in total	0.41	0.19	46.4
2. Area groups of agricultural holdings*			
N	0.20	0.13	65.7
I	0.40	0.17	41.7
II	0.47	0.16	34.1
III	0.55	0.17	31.7
3. Groups according to economic size (ESU)			
<2	0.27	0.16	62.2
2-<4	0.42	0.16	38.4
4-<8	0.46	0.15	32.9
8-<16	0.51	0.18	34.3
>16	0.57	0.16	28.6

*Comments as in Table 1

Source: questionnaire survey

The analysis of the coefficient W_i in the cross-section of the area groups of holdings and the cross-section of their economic strength confirms the earlier observed tendencies that the more increase in agricultural land and economic size of the farm, the more intensive relations of farmers with institutions will be (Table 5). Differences in this respect among groups of farms and the diversity inside groups measured with the coefficient of variation are distinct but not very great. In this respect, the only group that differs is a group of so called “inanimate” agricultural holdings, which is almost completely located in an aspect of economic size in the group of agricultural holdings to 2 of ESU. These agricultural holdings have 2–3 times lower level of intensity of the relations with institutions than the agricultural holdings from the remaining groups (Table 5).

Table 6. The parameters of the linear multiple regression determining dependence of income from an agricultural holding on the series of independent variables (function calculated for farms with direct payments, $n = 720$)

Independent variables	BETA	Statistical error BETA	B	Statistical error B	t (692)	level p
W. Free			-22221.4	8365.16	-2.6564	0.0080
X ₁ The EU payments supporting development of agricultural farms (in PLN)	0.2993	0.0268	0.4	0.03	11.1433	0.0000
X ₂ Market output (in PLN)	0.7313	0.0320	7.8	0.34	22.8374	0.0000
X ₃ Area in the ha (of agricultural land)	0.5238	0.1839	2840.2	997.30	2.8374	0.0045
X ₄ ? Costs on 1 ha of agricultural land (in PLN)	-0.4346	0.0321	-8.7	0.64	-13.5221	0.0000
X ₅ ? Economic size in ESU	0.0755	0.0266	307.9	108.5	2.8374	0.0046
X ₆ ? Coefficient of the intensity of relations with institutions W_i	0.0465	0.02345	21647.3	10912.0	1.9838	0.0476

$R = 0.8014$, $R^2 = 0.6371$, $Se = 41854$, $F(10; 692) = 124.2719$ $p < 0.000000$

Source: questionnaire survey

Statistical analysis of variables correlation was used to determine the correlation between farm earnings and the intensity of farmers' relations with institutions. The coefficient of farmers' relations with institutions as operand was accompanied by other operands which can influence the dependent value, i.e. farm earnings. Evaluation of correlation mechanism between the results of farmer's business activity and independent variables was carried out with the use of multiple linear regression. The regression function was estimated for “live” farms which deal with agricultural production (Table 6).

Procedure of progressing stepwise regression was used in order to determine the form of equation, which meant, consecutively, including in the list of independent variables – as provided in a model - the ones that had the biggest impact on the operand (Krysicki 1998). At the same time, purposefulness of including other variables already present in the equation is examined. The F-test statistic value (Fisher-Snedecor test) as compared to critical values of F given a suitable number of degrees of freedom and determined level of significance - in this paper agreed to $\alpha = 0.05$, is the criterion of obligatory presence

of variables in the equation. The above described procedure secures presence of only independent variables in the equation, i.e. the ones whose impact on operand is statistically relevant. The linear regression function of shaping income of agricultural holdings we can describe as follows:

$$\hat{y}_i = -22221.4 + 0,4 x_{1i} + 7.8 x_{2i} + 2840.2 x_{3i} - 8.7 x_{4i} + 307.9 x_{5i} + 21647.3 x_{6i}$$

Matching of outlined function to empirical data equals 64.2%, which is the percentage of farm earnings formed by six variables (included in Table 6) whose impact proved to be statistically significant (test p-values lower than 0.05). Intensity coefficient of farmers' relations with institutions is also among the variables which are statistically combined with farm earnings. The parameter also shows statistical significance in a regression model calculated for agricultural holdings of economic strength of 4 ESU.

Conclusions

1. Accessing the European Union by Poland contributed to the intensification of farmers' relations with institutional surroundings. It concerns especially the financial and advisory institutions and government agricultural agencies being an element of the institutional system of the Common Agricultural Policy.
2. The conducted research showed that there is positive, statistically essential interdependence between agricultural holdings' income and the level and intensity of the farmers' relation with the institutional surroundings.
3. A considerable and growing participation of the state aid is being recorded in agricultural holdings' income, mainly in the form of direct subsidies.
4. As a consequence, farmers show the greatest activity in the aspect of seeking and maintaining the relation with these institutions which are favorable to the absorption of EU funds by agricultural holdings.

References

- ARiMR, 2007, ARiMR - Trzy lata po akcesji (Agency for Restructuring and Modernization of Agriculture, Three years after accession), Warszawa.
- Kata R., 2008, Relacje rolników z otoczeniem instytucjonalnym (Farmers' relations with institutions), In: Czudec A., Kata R. (ed.), Rola lokalnych instytucji w przekształcaniach rolnictwa o rozdrobnionej strukturze gospodarstw (Function of local institutions in restructuring of dispersed farming), Wyd. Uniwersytetu Rzeszowskiego, Rzeszów.
- Krysicki W. (ed.), 1998, Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach (Probability and mathematical statistics: workbook), Wydawnictwo Naukowe PWN, Warszawa.