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ENDOGENOUS POTENTIAL OF RURAL AREAS VS. THE STRUCTURE AND ALLOCATION OF FUNDS UNDER THE 2007–2013 RDP

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Abstract. The main purpose of this paper is to assess the geographical diversification of and trends in the implementation of funds under the 2007–2013 RDP in relation to the endogenous potential of individual local government units. The amount of resources dedicated to implementing the program turned it into an instrument with a strong impact on rural development. Moreover, the program added considerable momentum to rural activities (provided that the population wanted to access European funds). The analysis of RDP funds allocation clearly demonstrated that the focal point was on the environment- and agriculture-related measures. However, there was not enough intervention which would drive the development of other functions and improvements in living standards for the villages.

Keywords: rural areas, EU funds, RDP, endogenous potential

INTRODUCTION

The changes taking place in the broadly defined socio-economic rural development largely result from the combined effect of two forces. On the one hand, they depend on the local economic growth, which in turn is conditioned by several endogenous factors, including: natural environment resources, agricultural development level, urbanization, or institutions and local organizations. What is more, the aforementioned factors are strongly related to a host of regional conditions in the form of economic, social, cultural or historical structures. According to Heffner (2007), "it can be assumed that the constant diverse socio-economic development of rural areas – from both the local and regional perspective – is an outcome of the simultaneous impact of exogenous and endogenous factors." On the other hand, in the era of progressing globalization, the impact of external forces (exogenous factors) becomes increasingly stronger, especially as regards the directions of capital flow around the world. Of the financial instruments which significantly affect the formation of local economy structures, special importance is ascribed to European Union (EU) funds. They provide more growth opportunities for the local economy while promoting the activation and a more efficient use of existing resources. The interdependence of both of these determinant groups is highlighted in the concept of neo-endogenous rural development (Adamski et al., 2007; Biczkowski, 2013; 2016; Klekotko, 2005; Ray, 1997, 2006).

As one of the possible research approaches, this paper presents some problems related to the analysis of dependencies between the internal potential of local government units and the absorption level of RDP funds. This paper is part of the author's continuous study on the absorption of EU funds, especially in rural areas.

The main purpose of this paper is to assess the geographical diversification and implementation level of funds under the 2007–2013 RDP in relation to the

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endogenous potential of individual local government units. The study covered the whole country; the district was the basic geographic unit, whereas the synthesis was carried out on a regional basis[1]. This made it easier both to preserve the holistic, nationwide perspective and to identify the units with an active or passive attitude towards applying for funds. Undeniably, the above approach adds quality to this study.

ASSUMPTIONS, RESEARCH METHODOLOGY AND SOURCE MATERIALS

The use of funds under the 2007–2013 RDP was analyzed in two aspects: the level of funds absorption, and the endogenous potential at district level. The analysis took account of both the number of beneficiaries (activity) and the amount of money obtained (absorption). In the first stage, considering the large number of activities implemented under the RDP, the author decided to divide[2] them arbitrarily into support areas (modules) by basic objective:

- Module 1. Improving the productivity and competitiveness of agricultural holdings (measures: Modernization of agricultural holdings; Adding value to agricultural and forestry products; Restoring agricultural production potential damaged by natural disasters; Participation of farmers in food quality schemes; Agricultural producers' groups);
- Module 2. Improving the demographic structure of farm managers (Structural pensions; Setting-up of young farmers);
- Module 3. Land quality and land use structure (Environmental management scheme, Afforestation; LFA; Land reparcelling; Restoring the forestry potential);
- Module 4. Improving the economic standing of agricultural holdings and rural population (Diversification of agricultural activity; Establishment and development of micro-enterprises; Support for semi-subsistence farms);
- Module 5. Improving the standards of living for villages (Renovation and development of villages; Basic services for the economy and rural population; Implementing cooperation projects);
- Module 6. Vocational trainings, consultancy services, informative and promotional activities.

Subsequently, they were correlated and compared with the characteristic conditions of endogenous potential at local government level, thus creating a background for the analysis (cf. Table 1).

The determinants were categorized as described above in an effort to answer the following question: does any of the conditions affect the distribution of activity (number of beneficiaries) and effectiveness (absorption level) of applications for external funds? If so, then how? Then, dependencies could be identified between the endogenous potential of local government units (districts) and the preferred allocation of RDP funds, taking the proposed modular system into consideration.

The aggregated database had a dual nature (absorption level/endogenous potential) and relied on district-level data. For a comprehensive analysis of both areas, a series of indices[3] were used. Once standardized, they can be compared against each other: their mean distribution value was zero, while their variances and standard deviations equaled one (Racine and Raymond, 1977).

Consequently, it became possible to analyze the indices structured into a composite index created individually for each area as per the formula below:

$$Z_{in} = \frac{Z_{in} - X_n}{\sigma_n}$$

where:

Z_{in} – normalized value of feature n in the district
X_{in} – actual value of feature n in the district
X_n – arithmetic mean of feature n
σ_n – standard deviation of feature n.

[1] Due to formal restrictions of this paper, the geographic differences in the level of funds absorption were presented at district level, whereas voivodeship-level data was used for the synthesis.

[2] The analysis excluded some projects as they could not be unambiguously ascribed to particular administrative units (e.g. within measure "Running of Local Action Groups").

[3] The analysis of the level of absorption of RDP funds relied on the following indices: (a) number of beneficiaries per: 100 rural population, 100 villages, 100 agricultural producers (according to the Agency for the Restructuring and Modernization of Agriculture, ARMA), 100 ha of agricultural land, and (b) amount of funds accessed per: rural resident, village, agricultural producer, and hectare of agricultural land.

Table 1. Endogenous conditions of geographic disparities in amounts of RDP funds

Type of conditions	Basis of delimitation	Division into groups
Natural	agricultural production area quality index (APAQI[4]; average score for Poland = 66)	1 – unfavorable (below 60.0) 2 – medium-high (60.0-70.0) 3 – favorable (over 70.0)
Urbanization	(districts located within metropolitan areas; division of land according to the Central Statistical Office, after: Marchlewski, 2006)	1 – poorly urbanized districts (predominance of rural population) 2 – medium-urbanized districts (predominance of urban population, location outside metropolitan areas) 3 – highly urbanized districts (in metropolitan areas)
Agricultural development level	calculated based on the average normalized value of the following characteristics: farm area (ha); share of farms run by people with a secondary or higher education; ratio of expenditures to fixed assets; number of harvesters per 100 ha of sown land; area of industrial crops (% of total sown area); livestock density (LSU[5] per 100 ha of utilized agricultural land, UAA)	based on the standard deviation distribution, the districts were divided as follows by level of agricultural development: 1 – low ($\leq -0.50\delta$) 2 – medium (-0.49δ to 0.49δ) 3 – high $\geq 0.50\delta$)
Historical	political borders established by the partitioning authorities, resulting in the consolidation of various economic systems and social structures, the effects of which are observed to this day[6]	1 – area of the former Austrian Partition 2 – area of the former Prussian Partition 3 – area of the former Russian Partition

Source: own elaboration.

Based on the distribution of the composite index values, all districts were categorized under one of three types: 1) poor conditions / low absorption level (below -0.25δ); 2) average conditions / medium absorption level (-0.25δ to $+0.25\delta$); 3) favorable conditions / high absorption level (above $+0.25\delta$) (cf. Fig. 1, 5). The resulting 9 variants (3^2) enabled the identification of structural patterns of the absorption of 2007–2013 RDP funds (cf. Fig. 6).

To best reflect the significance and role of the program, the analysis was conducted at different geographic levels: from the national level, through to the regional (16 voivodeships) and local level (314 districts). The study was based on the 2007–2013 RDP data, as delivered by the Agency for Restructuring and Modernization of Agriculture (ARMA, as at March 30, 2016), related to the number of beneficiaries and payments effected. The ARMA's register of agricultural producers (who hold more than 1 ha of agricultural land) was used. The analysis also relied on data on the number (1340.7 thousand) and area of agricultural holdings (13,521.4 thousand ha). Moreover, the author tapped into the resources of the Local Data Bank of the Central

[4] APAQI takes the major components of the natural environment into consideration, i.e.: soil quality, agroclimate, landform and hydrographic aspects. The territories are assessed in terms of agricultural development.

[5] LSU (livestock unit), a conventional unit which facilitates the aggregation of farm animals in an agricultural holding, and is the equivalent of a 500 kg cow according to the Polish standards (Regulation of the Council of Ministers of November 9, 2004; Journal of Laws [Dz.U.] of 2004, No. 257, item 2573, http://isap.sejm.gov.pl/DetailsServlet?id=WDU20042572573).

[6] There are considerable differences in agrarian structures (agricultural land fragmentation and small agricultural holdings in the territories of the former Austrian and Russian Partitions, as opposed to large agricultural holdings and a high level of agrarian culture in the territories of the former Prussian Partition) and differences in socio-economic development (low levels in the former Russian Partition, high levels in the former Prussian Partition). When it comes to social aspects, the population visibly differs in attitudes, e.g. in culture and mentality typical of each partition: while entrepreneurship is well developed in the former Prussian and Austrian Partitions, low education levels and passive attitudes can be observed in the former Russian Partition.

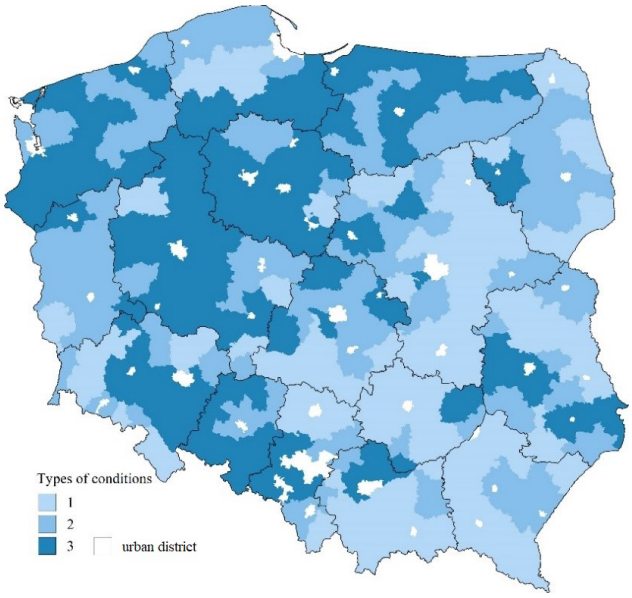

Fig. 1. Endogenous potential by district
Source: own elaboration based on data from the Local Data Bank of the Central Statistical Office.

Statistical Office for other characteristics of rural areas: population (15,969.0 thousand) and number of villages (43,082).

STRUCTURE AND GEOGRAPHIC ALLOCATION OF FUNDS UNDER THE 2007–2013 RDP

So far, the 2007–2013 RDP has been the largest rural and agricultural development program implemented in Poland and financed from the Community budget. It accounted for ca. 70% of total funds allocated in 2000–2013[7] under the Common Agricultural Policy (CAP). It was so because it was the first time Poland participated in a program throughout its seven-year financial perspective.

As shown by the analysis, 1/3 of the entire RDP budget was allocated to measures affecting land quality and land use (module 3). These were predominantly environmental instruments (Afforestation, Environmental management scheme) designed to improve the land use structure (Land reparcelling), or compensatory aid for agricultural holdings operating in less favored areas (LFA, Restoring the production potential). In the Zachodniopomorskie, Lubuskie and Warmińsko-Mazurskie voivodeships, funds allocated to the abovementioned purposes made up 51–56% of total funds available in these regions. However, in the Śląskie, Małopolskie, Opolskie and Świętokrzyskie voivodeships, that ratio did not exceed 23% (cf. Fig. 2A, 2B, 3, 4).

The second most important line of support (22% of total funds) was related to module 1, i.e. technical equipment in agriculture and enhanced productivity and competitiveness of agricultural holdings. These measures were strictly investment-based and directly contributed to agricultural competitiveness. Retrofitting and modernization funds were mostly allocated to agricultural holdings in locations characterized by high-quality production land where the average index of

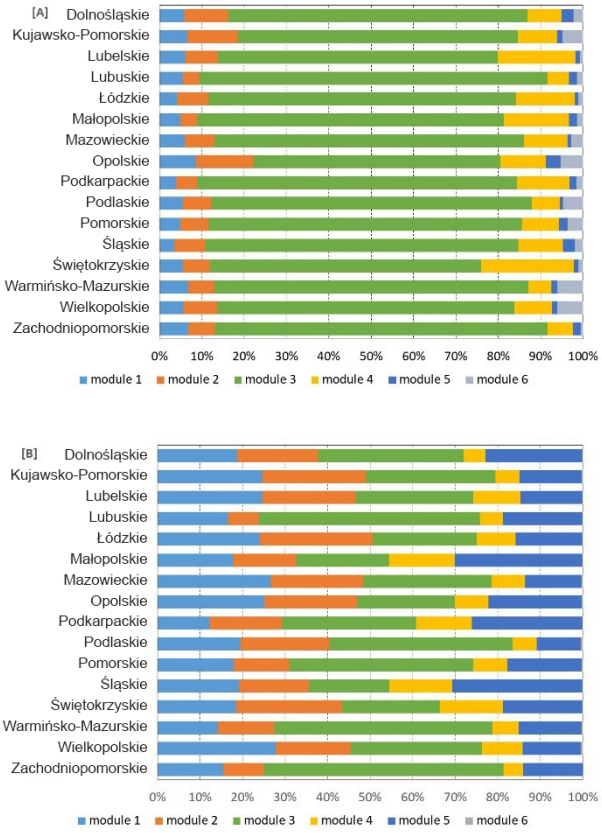

Fig. 2. Beneficiary (A) and financing (B) structure of the 2007–2013 RDP, grouped by support areas (modules)
Source: own elaboration based on ARMA data.

[7] In fact, the 2007–2013 RDP ended in 2015, in line with the n+2 principle.

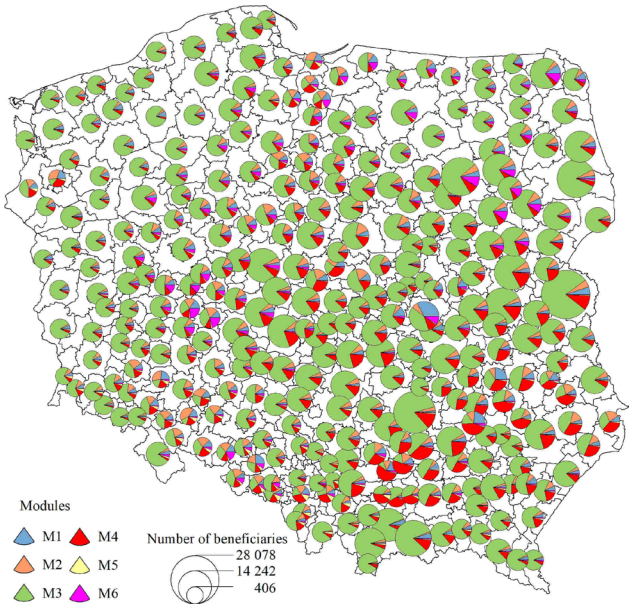

Fig. 3. Number and structure of beneficiaries under the 2007–2013 RDP by district
Source: own elaboration.

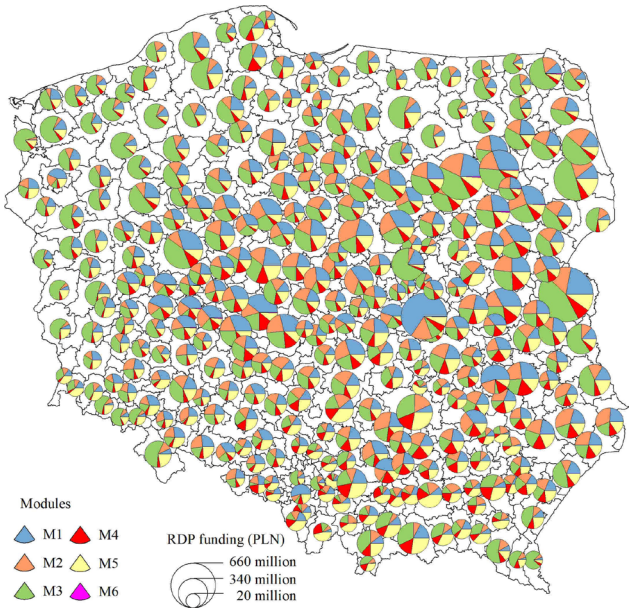

Fig. 4. Amount and structure of financing disbursed under the 2007–2013 RDP (by district)
Source: own elaboration.

commercialization of agricultural production was relatively high (above PLN 2,000 per hectare of agricultural land): Wielkopolskie voivodeship (28%), Mazowieckie voivodeship (27%), Kujawsko-Pomorskie voivodeship (25%), Lubelskie voivodeship (25%) and Opolskie voivodeship (25%).

Funds were also allocated to promote changes in the demographic structure of farm managers (module 2). This type of support accounted for 19% of total funds granted. It was most visible in the Łódzkie and Świętokrzyskie voivodeships (25–27% of total funds allocated to these regions). On the other hand, this kind of aid played the smallest role in the former Prussian Partition (the territory with the largest average farm size): Lubuskie, Zachodniopomorskie, Warmińsko-Mazurskie and Pomorskie voivodeships (7–13%) (cf. Fig. 2A, 2B, 3, 4). Additionally, this module also had an impact on the agrarian structure (Structural pensions) and modernization of agricultural holdings (Setting-up of young farmers).

In terms of funds allocated, module 5 (improving the standards of living for villages) was slightly less important. Nearly 17% of total RDP funds were allocated to this type of support. In the absorption structure, this trend was most evident in southern Poland, i.e. in Śląskie, Małopolskie, Podkarpackie, Dolnośląskie and Opolskie voivodeships (22–31%). The relevant investments usually involved the modernization of cultural, leisure and sport venues; renovation of historical objects; modernization of public space in villages; and development of technical infrastructure.

Module 4, designed to improve the economic situation of agricultural holdings and to promote multipurpose development of rural areas, had a relatively small share (9% of total funds). These funds were to support economically weaker agricultural holdings which wanted to diversify their sources of income and shift towards non-agricultural activities. The devaluation of existing drivers of rural development and agricultural production – combined with the fading of the traditional, agriculture-based rural culture – intensifies the pursuit for new lines of specialization. The geographic pattern of funds allocation identified in this group is almost the opposite of the pattern for module 1. This module was most appealing to farmers in the south-east (Śląskie, Małopolskie, Świętokrzyskie, Podkarpackie and Lubelskie voivodships), where it reached a level of 11–16%.

The last of the modules considered, i.e. training, promotion and consultation activities, etc., was marginal in its impact as it merely constituted 0.2% of total RDP funds.

The analysis of RDP funds allocation by module clearly demonstrated that the focal point was on the environment- and agriculture-related measures. Even though agriculture continues to be the most important function or rural areas, note that the scope of activities taken to develop other functions (in line with the multipurpose development model), to improve the standards of living and to strengthen the identity of rural areas is too narrow (Pondel, 2017).

ENDOGENOUS POTENTIAL VS. ALLOCATION OF RDP FUNDS

As far as the specified groups of determinants are concerned, the analysis revealed (cf. Tab. 1, 2, Fig. 5):

- there is a considerable decrease in the level of funds absorption as the agricultural production area quality index (APAQI) increases; higher levels of farming activity in LFAs illustrate the stabilizing effect of RDP funds since they compensate for the hardships suffered by those farmers;
- large differences in the use of funds between farms at different levels of agricultural development; the amounts converted into per capita and per agricultural producer figures show that funds are better absorbed in areas with a better agrarian culture; but when converted into per hectare of agricultural land figures, quite the reverse can be observed;
- the level of absorption decreases as urbanization is progressing; beneficiaries from less urbanized areas used relatively more funds although the differences were not as significant as in the case of the natural determinant;

Table 2. Basic parameters used in assessing the level of absorption of funds under the 2007–2013 RDP

Voivodeship	Number of beneficiaries per				Amount of payments (in PLN) per			
	100 population	100 villages	100 agricultural producers	100 ha AL	capita	village	agricultural producers	1 ha AL
Dolnośląskie	5.1	2 040.2	87.3	5.8	2 675	1 072 383	45 873	3 028
Kujawsko-Pomorskie	8.8	2 789.2	121.7	7.8	3 894	1 230 344	53 698	3 436
Lubelskie	13.4	4 866.7	95.6	12.6	4 027	1 462 243	28 718	3 788
Lubuskie	7.8	3 178.7	172.9	8.7	3 685	1 509 199	82 076	4 138
Łódzkie	15.4	3 298.4	118.8	15.6	3 872	829 787	29 886	3 921
Małopolskie	6.1	5 812.2	84.1	22.0	1 455	1 379 486	19 965	5 233
Mazowieckie	14.0	3 462.4	134.9	15.3	4 028	995 678	38 796	4 402
Opolskie	4.3	2 208.0	79.7	4.6	2 431	1 244 824	44 948	2 570
Podkarpackie	7.3	6 119.2	79.0	18.1	1 861	1 553 912	20 051	4 609
Podlaskie	26.0	4 177.4	182.6	14.2	7 588	1 220 463	53 335	4 153
Pomorskie	7.0	3 257.5	151.7	8.3	3 109	1 445 610	67 304	3 672
Śląskie	3.8	3 664.7	89.4	13.3	1 467	1 424 596	34 756	5 153
Świętokrzyskie	13.0	4 236.4	107.1	19.6	3 027	987 124	24 951	4 573
Warmińsko-Mazurskie	11.1	2 973.6	172.5	7.7	4 656	1 246 748	72 338	3 218
Wielkopolskie	9.8	3 717.2	136.3	9.7	3 793	1 442 672	52 907	3 765
Zachodniopomorskie	6.9	2 497.0	163.9	5.6	4 195	1 507 339	98 915	3 385

Source: own elaboration based on data from the Local Data Bank of the Central Statistical Office and from ARMA.

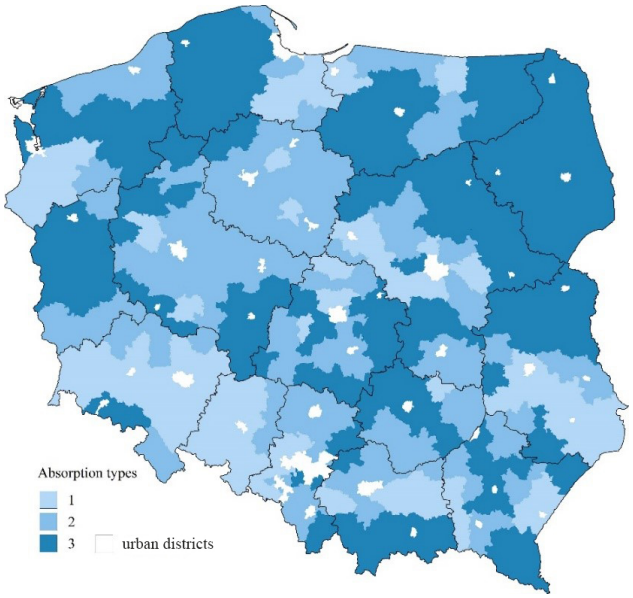

Fig. 5. Types of absorption level under the 2007–2013 RDP
Source: own elaboration based on ARMA data.

- large disproportions in the use of funds within the historically-based political boundaries, especially between the former Prussian Partition, on the one hand, and the former Austrian and Russian Partitions, on the other hand.

An in-depth analysis of the modules demonstrated substantial differences between individual types of funds. Generally, most of the indices pointed to a higher absorption level in districts less favored by natural conditions, less urbanized and historically based in the former Russian Partition, though at a higher level of agrarian development. Interesting correlation was noted between environmental conditions and the type of existing (preferred) activity. The more favorable the natural conditions, the more willing the farmers are to apply for funds for modernization and making their agricultural holdings more competitive (module 1). On the other hand, the less favorable the conditions for agricultural development, the more willing the beneficiaries are to seize the opportunity to diversify their income sources (module 4). This attitude was additionally strengthened by the historical factor, with the largest differences being observed between the former Prussian Partition (high level of proactive entrepreneurship among beneficiaries) and the Austrian Partition (little enthusiasm to develop non-agricultural activities).

The dependency analysis showed the following correlation: the more production-efficient the agricultural holdings in a local government unit, the larger is the number of projects implemented and the higher is the amount of investment funds accessed. For larger and richer agricultural holdings, it is easier to raise the required own capital, be granted overdraft facilities for modernization, and implement more expensive projects. Less commercialized farms with additional income sources do not actively apply for agricultural development funds. Instead, they are more active in using the instruments for the diversification of agricultural activity. These observations are corroborated by Rosner's findings (1999): "farmers who consider their agricultural holdings as ones without focus on the market are more inclined to choose the survival strategy, while those whose objective is to market their produce are more disposed toward turning their agricultural holdings into modern commercial farms." The observed trends in funds allocation and the interest taken in pro-investment activities bring about the assumption that they are bound to increase performance indicators in agriculture. By the same token, they will contribute to higher commercialization and profitability of the agricultural holding itself. They also make it easier to match the production scale to market needs and to introduce sophisticated technological solutions to agriculture.

The final stage of the analysis was to identify the structural patterns of the absorption of RDP funds. Based on the deviation from the standardized mean, three groups were specified in each area (cf. Table 3):

- by endogenous conditions: A) unfavorable, B) average, C) favorable;
- by absorption of RDP funds: 1) low, 2) average, 3) high.

As a result, nine structural patterns of absorption were identified (cf. Fig. 6). The most common is A3 (55 districts), which – as far as convergence is concerned – should be deemed positive because unfavorable development conditions coincide with a high level of RDP funds absorption. A similar situation was found in 48 districts of type B3 (average conditions, high absorption). A1 (15 districts) and B1 (14 districts) are the least beneficial because the unfavorable or average conditions coincide with a low level of activity in applying for RDP funds. On the other hand, 28 districts

Table 3. Conditions and levels of absorption of RDP funds

Conditions		Number of applications processed per				Amount of payments (PLN) per			
		100 population	100 villages	100 agricultural producers	100 ha AL	capita	village	agricultural producer	1 ha AL
Natural	1	14.2	4 484.2	155.3	17.1	3 814.7	1 200 915.9	41 584.7	4 584.1
	2	10.2	3 668.8	126.2	11.4	3 502.2	1 255 393.5	43 168.1	3 894.2
	3	5.6	2 543.7	69.1	6.9	2 561.6	1 171 816.5	31 830.7	3 190.3
Agricultural	1	8.6	4 499.8	109.5	19.1	2 144.2	1 126 205.4	27 393.3	4 772.8
	2	11.4	3 811.6	124.1	12.4	3 641.5	1 219 070.9	39 687.6	3 964.4
	3	9.6	2 980.1	116.8	8.1	4 071.2	1 261 581.0	49 444.6	3 446.9
Urbanization	1	11.9	4 222.6	110.3	14.0	3 514.5	1 245 181.2	32 516.1	4 141.9
	2	9.3	3 377.4	123.6	10.3	3 291.6	1 190 817.4	43587.2	3 645.5
	3	6.0	2 845.4	118.9	9.6	2 559.6	1 215 948.8	50 815.8	4 090.5
Historical	1	6.0	6 006.8	80.8	20.3	1 462.7	1 475 077.8	19 840.8	4 982.3
	2	7.1	2 898.9	130.5	7.1	3 396.3	1 394 220.4	62 757.7	3 403.8
	3	14.5	3 797.0	122.4	14.8	4 066.5	1 067 969.8	34 418.4	4 160.2

Source: own elaboration based on data from ARMA and from the Local Data Bank of the Central Statistical Office.

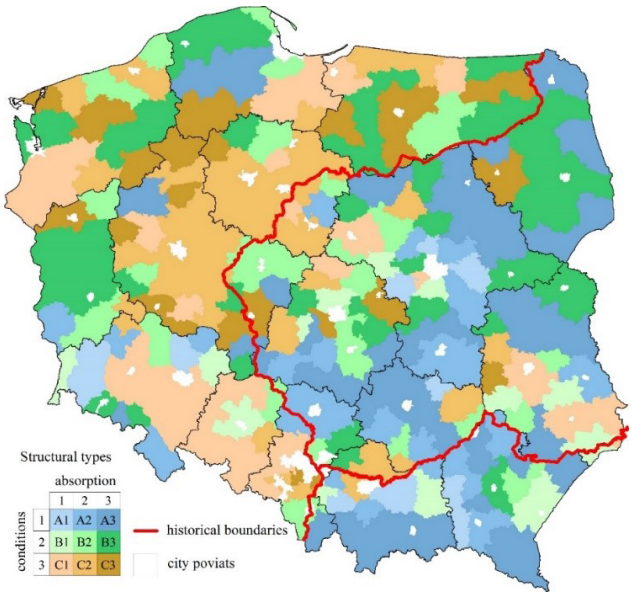

Fig. 6. Structural patterns of the level of funds absorption under the 2007–2013 RDP (the table specifies the number of districts by type)
Source: own elaboration based on data from ARMA and from the Local Data Bank of the Central Statistical Office.

were identified (C3) where a considerable endogenous potential was accompanied by high absorption levels of external funds. Generally, the types with lower endogenous potential (A1, A2, A3) are prevalent is eastern and south-eastern Poland, whereas those enjoying favorable conditions (C1, C2, C3) dominate in the western and north-western part of the country.

CONCLUSIONS AND DISCUSSION

The availability of European funds opened up a plethora of new opportunities to intensify rural modernization and restructure the Polish agriculture sector. Before joining the European Community, Poland struggled with these issues due to reasons such as the condition of the labor market and lack of adequate capabilities to raise funds. As recalled by Zegar (2015), the integration enabled extending the CAP mechanisms to the Polish agriculture while solving the problem of capital shortage, freeing farms from some of the excessive workforce through emigration, and opening up a new extensive market.

The purpose of this analysis was to assess the geographical diversification and level of implementation

of funds under the 2007–2013 RDP in relation to the endogenous potential of individual local government units. Not only did the study address the level of interest taken in the program (number of beneficiaries) and the amount of funds accessed, but it also attempted to identify the endogenous conditions affecting the absorption level of RDP funds. According to the trends observed, there is intensification of agricultural production in areas well placed for the development of that function. It promotes the creation of economically sound agricultural holdings capable of competing with their counterparts from other EU countries. On the other hand, it has not escaped the author's attention that there is gradual extensification of agricultural activity in areas with highly valuable environmental assets (large share of forests and lakes, varied topography) which are better positioned to develop tourism and forestry. Evidently, these areas are characterized by a higher level of non-agricultural activity (diversification of income sources, multi-functionality) (North and Smallbone, 2006).

Therefore, the main goal of subsequent RDP editions should be to skillfully allocate the resources so as to enable tapping into the endogenous potential of rural areas which is inherent to particular regions. A wider leeway in the way RDP funds are disbursed (when compared to the first pillar of the CAP) makes it possible for the authorities at different levels to shape and direct the changes occurring in villages (Dwyer et al., 2007). Despite various deficiencies, as pinpointed by researchers, in the structure and allocation of support for rural and agricultural development, the convergence between EU countries is noticeably progressing (e.g. Jankova et al., 2016; Rogalska et al., 2016). An insufficient impact of the funds on sustainable rural development does not preclude the (mostly) positive effects the implementation of EU funds has on economic growth, in broad terms (Špetlík, 2017; Carnicky and Megyesiova, 2017).

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