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ҰЛТТЫҚ ҒЫЛЫМ АКАДЕМИЯСЫНЫҢ

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NAS RK is pleased to announce that Bulletin of NAS RK scientific journal has been accepted for indexing in the Emerging Sources Citation Index, a new edition of Web of Science. Content in this index is under consideration by Clarivate Analytics to be accepted in the Science Citation Index Expanded, the Social Sciences Citation Index, and the Arts & Humanities Citation Index. The quality and depth of content Web of Science offers to researchers, authors, publishers, and institutions sets it apart from other research databases. The inclusion of Bulletin of NAS RK in the Emerging Sources Citation Index demonstrates our dedication to providing the most relevant and influential multidiscipline content to our community.

Қазақстан Республикасы Ұлттық ғылым академиясы "ҚР ҰҒА Хабаршысы" ғылыми журналының Web of Science-тің жаңаланған нұсқасы Emerging Sources Citation Index-те индекстелуге қабылданғанын хабарлайды. Бұл индекстелу барысында Clarivate Analytics компаниясы журналды одан әрі the Science Citation Index Expanded, the Social Sciences Citation Index және the Arts & Humanities Citation Index-ке қабылдау мәселесін қарастыруда. Web of Science зерттеушілер, авторлар, баспашылар мен мекемелерге контент тереңдігі мен сапасын ұсынады. ҚР ҰҒА Хабаршысының Emerging Sources Citation Index-ке енуі біздің қоғамдастық үшін ең өзекті және беделді мультидисциплинарлы контентке адалдығымызды білдіреді.

НАН РК сообщает, что научный журнал «Вестник НАН РК» был принят для индексирования в Emerging Sources Citation Index, обновленной версии Web of Science. Содержание в этом индексировании находится в стадии рассмотрения компанией Clarivate Analytics для дальнейшего принятия журнала в the Science Citation Index Expanded, the Social Sciences Citation Index и the Arts & Humanities Citation Index. Web of Science предлагает качество и глубину контента для исследователей, авторов, издателей и учреждений. Включение Вестника НАН РК в Emerging Sources Citation Index демонстрирует нашу приверженность к наиболее актуальному и влиятельному мультидисциплинарному контенту для нашего сообщества.

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THE INFLUENCE OF COOPERATIVE BANK OUTLETS UPON LOCAL DEVELOPMENT IN THE PODLASKIE VOIVODESHIP IN POLAND

Abstract. The objective of the paper is to evaluate whether the presence of cooperative banks stimulates local development in the municipalities of the Podlaskie Voivodeship in Poland. For this purpose, we have studied the relation between the presence of cooperative banks in 118 municipalities of the voivodeship and the dynamics of changes of selected socio-economic factors: total and own revenues of individual municipalities, their number of inhabitants, number of businesses, average monthly pay and the level of unemployment. The analysis covers the period between Poland's accession into the European Union and the year 2018. Our results do not confirm earlier findings indicating a close connection between the presence of cooperative banks and local development.

Keywords: banking sector, cooperative banks, local economic growth, DEA.

Introduction. The savings and credit cooperative movement in Europe dates back to the 19th century, to Franz Hermann Schulze-Delitsch, who organised credit cooperatives for the town-dwelling lower middle classes, and to Friedrich Wilhelm Raiffeisen doing similar work for poor rural farmers (Engelhardt, 1990; Aschhoff, 1982). Their chief goal was to create institutions providing short-term financing for small entrepreneurs, workers and farmers, and to encourage those groups to accumulate savings on favourable terms. Their rationale was mainly to make poor social classes independent of loans commonly granted at usurious rates [1].

Today, cooperative banks constitute a significant segment of the loan market in Europe. They have over 20% share in the deposits and loans of the sector in countries such as France, Austria, Finland, Germany and Holland (EACB, 2019). They serve about 209 million clients, i.e. over 40% of the EU population (EACB, 2019a). Two different types of cooperative banks evolved in Europe. One type are international corporations, loosely founded on cooperative principles. The other are smaller banks operating locally (Cornéeet al., 2018, Miklaszewskaet al., 2018, Groeneveld, 2017). The latter type dominates in Central and Eastern Europe. Only in Hungary and Poland cooperative banks play a significant role in the banking sector. Poland is the largest country in the region in terms of cooperative banks' assets, number of outlets, and number of members and staff [2].

The first banking institution in Poland that operated as a loan foundation was Fundacja Ostrołęcka TaniegoKredytu (the Ostrołęka Cheap Credit Foundation), established in 1577 by Wawrzyniec Białobrzeski. The first cooperative banking institutions in the modern sense of the word were Towarzystwo Pożyczkowedla Przemysłowców Miasta Poznania (the City of Poznań Industrialists' Loan Society), established in 1861, and the loan societies in Brodnica and Golub, established in 1862. All three continue to operate as cooperative banks, which makes them the oldest Polish banks (Ochociński, 1961). According to the data by the Polish Financial Supervision Authority, at the end of April 2019 there were 545 cooperative banks in Poland, constituting 7.17% of the total assets of the banking sector (KKNF, 2019). According to the existing regulations, only individuals can be founders of a cooperative bank. The

Table 1 – Descriptive statistics

Variable	Mean	Std. Dev.	Minimum	Median	Maximum
REV	2.9418	0.5054	1.8043	2.8703	4.6279
OWNREV	3.0247	0.8044	1.2814	2.9059	5.5482
POP	0.9475	0.0953	0.7689	0.9423	1.3563
REG	1.1946	0.2769	0.5990	1.1671	2.1673
SAL	1.9931	0.1838	1.5900	1.9711	2.3238
UNEMP	0.5287	0.1596	0.1553	0.5050	0.9922
CCB	0.9661	0.7946	0	1	6
BANK	2.0424	3.3675	0	1	21
CCBBRANCH	1.1695	1.7012	0	1	16
BANKBRANCH	3.3136	11.6088	0	1	118
EFFECT	0.2966	0.5440	0	0	3

number of founders cannot be fewer than ten, and the initial capital cannot be less than PLN equivalent of euro 1 000 000. Depending on their assets, cooperative banks are subject to limitations of the territorial and material scope of their operation. They are also obligated to join an affiliating bank if their initial capital does not exceed the equivalent of euro 5 000 000.

The objective of this paper is to establish whether the presence of cooperative banks stimulates local development in the municipalities (gmina) of the Podlaskie Voivodeship in Poland. For this purpose, we have studied the relation between the presence of cooperative banks in 118 municipalities of the voivodeship and the dynamics of changes in selected socio-economic factors: total and own revenues of individual municipalities, their number of inhabitants, number of businesses, average monthly pay and the level of unemployment [3]. The analysis covers the period between Poland's accession into the European Union and the year 2018.

To our knowledge, this is the first in-depth analysis conducted at the level of individual Podlaskie municipalities. Our findings can be applied broadly, aiding the design of commercial banks' strategies in the context of the increasing regulatory requirements. They can also serve local communities in broadening their knowledge about the significance of cooperative banks in their area.

The article is structured as follows. Section 2 reviews the most significant literature. Section 3 describes the data and methodology employed in the empirical research. Section 4 presents and discusses the obtained results. Section 5 summarises and presents the main conclusions [4].

Methods. When writing the article, general scientific and special methods were used, such as: system analysis method; content analysis method; comparative analysis method; method of analysis and synthesis; system approach method.

Cooperative banks' model of operation differs from that of typical commercial banks. Its most important specific characteristics include: I) member ownership – the bank's owners are cooperative members, who are also its clients, II) democratic governance, based on the "one person, one vote" principle, III) most of cooperative banks are local, their presence supports the local community and regional development, IV) their operation is based on relationship banking and concentrates in rural areas and small towns, providing products and services mainly to farmers, small and medium businesses and individual households, V) generating profit is necessary for the banks' development, nevertheless maximising profit is not their main objective. A large part of the net profits has to be retained, VI) cooperative banks have a long tradition of commitment to sustainability and social values. A proportion of the banks' profits are invested in local economic initiatives that also benefit the local community in the field of culture, sport and education (Cornéeet al., 2018, Golec and Płuciennik, 2017, Hudon and Perilleux, 2014, p. 147, Ayadiet al., 2010) [5].

Founding their business strategy on basic operation (deposits and credits), and refraining from complicated instruments of investment banking allowed cooperative banks to avoid problems experienced by most commercial banks as a result of two serious global financial crises: the first one, caused by

subprime credits, and the second, connected with problematic debts of Eurozone countries. Extensive research indicates that cooperative banks proved more resistant to crises than commercial banks, which are orientated towards shareholder value creation (Fiordelisi and Mare, 2014, Birchall, 2013, Ferri, 2012). A similar opinion is voiced by authors basing their research on the Z-score analysis (Barra and Zotti, 2019, Köhler, 2015, Hesse and Cihák, 2007). However, Chiaramonte et al. (2015) note that in the crisis period only, cooperative banks have a higher natural logarithm of the Z-scores than commercial banks. Therefore, the stabilising power of cooperative banks is specifically detectable during crises, but only above a certain market share threshold [6].

Such tendency is often explained by the cooperative banks' operating strategy, which is largely based on long-term relationships with customers, who often are the bank's owners as well. Catturani et al. (2016) emphasise that cooperative banks are known for their local relationship lending, whereby they collect soft information about borrowers that helps to reduce the agency costs related to moral hazard and adverse selection. Personal relationships with financial advisers are usually far more important than grand programmes of customer acquisition and sales of products and services, which commercial banks conduct via costly marketing campaigns. Clients visiting a cooperative outlet and being served at the counter instinctively perceive the atmosphere of the place. They feel appreciated when privileges are offered to them, they get used to members of staff and, in a way, they identify with their bank. Traditional service projects a larger sense of credibility and security than centralised and hierarchical organisational structures of commercial banks (Ayadi et al., 2010). Local knowledge and flexibility give local institutions significant advantage over commercial banks, where the credit procedure is often brought down to a standardised calculation of creditworthiness by computer applications, followed by a mechanical credit decision [7]. Cooperative banks, while sticking to appropriate procedures, take advantage of a niche created by such approach and serve the clients rejected by commercial banks. This particularly refers to customers who are difficult to obtain information about, or even those suffering from financial exclusion, such as start-ups, clients operating in high-risk sectors or sectors unattractive to commercial banks, customers with irregular income or obtaining their income in a non-standard manner (Waupsch, 2017, p. 11; Becchettiet al., 2016; Catturaniet al., 2016). Ory and Lemzeri (2012) emphasise that cooperative banks still exhibit a more decentralised decision-making process than do their commercial counterparts.

Other research is less unequivocal about commercial banks' stability. For example, W. Fonteyne'a (2007) reckons that cooperative banks may be more vulnerable to certain shocks, including credit quality and interest rate developments. Also the relationship banking may contribute to increased credit risk and worsened credit portfolios, because of the weakened quality of credit monitoring, less reliable classification of clients into individual credit risk categories, ignoring or dismissing warning signals about financial condition of credit takers or overdue repayments, delaying debt collection and restructuring, incorrect estimation of the reasons for credit value loss or the reduced value of collaterals etc. Furthermore, due to the local character of their operation, the portfolios of cooperative banks are usually less diversified, which may lead to the risk of concentration resulting from excessive exposure to a single company or sector [8].

The findings are similarly unclear with regard to the efficiency of cooperative banks, even though most reports indicate their higher efficiency compared to commercial banks. Makinen and Jones (2015) analysed 521 European banks during the years 1994-2000. They conclude that mean inefficiency scores vary by ownership type and are lower for cooperative banks than for commercial and savings banks. According to their report, cooperative banks were about 3 percentage points more efficient (less inefficient) than savings and commercial banks. The Authors conclude that the cooperative ownership form has a positive contribution to cost efficiency in European banking. Girardoneet al. (2009) confirm that cooperative banks operating in the EU-15 countries in the years 1998-2003 were significantly more cost efficient than commercial banks. L. Weill (2004) measures the cost efficiency of banks from five European countries (France, Germany, Italy, Spain, and Switzerland) with three approaches: stochastic frontier approach, distribution-free approach, and data envelopment analysis. He finds that cooperatives have a cost efficiency advantage relative to commercial banks in all countries except Italy. San-Jose et al. (2018) analysed 2752 financial institutions in EU-15 countries. They found no significant differences between credit cooperatives and banks, regarding economic efficiency. Kontolaimou and Tsekouras (2010) came to different conclusions. They analysed the productive performance of European cooperative banking firms

as compared to their commercial and savings counterparts, taking into account the existence of technology heterogeneity due to different ownership forms. They suggest that the type-specific frontier corresponding to cooperative banking firms, at least to its largest part, lies away from the European metafrontier, indicating the existence of a significant technology gap. Most research conducted in the Polish banking sector indicates lower efficiency of cooperative banks (Perek, 2014, Siudek, 2011).

However, most reports indicate a clearly positive influence of cooperative banks upon local activity and communities. Ayadiet al. (2010) show that cooperative presence appears to have a significant pro-growth impact in Austria, Finland, Germany and the Netherlands. For Germany, there is a self-reinforcing effect: more growth enhances activity, which in turn increases growth further. For Austria and the Netherlands, however, a different pro-growth dynamic is at play: cooperatives maintain their activities in areas experiencing low growth and thereby help soothe income differences. Also Coccorese and Shaffer (2018) show that cooperative banks play a significant role in enhancing local economic performance in Italy. Their finding suggest that that the initial presence of cooperative banks is associated with significant additional growth of income, employment and firms. Their research confirms the earlier findings of Usaii Vannin (2005), according to which cooperative banks display a positive impact (in the short, medium and long run) on the rate of regional economic growth, irrespective of how it is measured (GDP per head or value added per worker) [9].

Slightly different results were obtained by Hakenes *et al.* (2015). They find that regional savings banks have a positive and significant effect on regional development proxied by the growth rate of business registrations. The highly significant negative coefficient on the interaction term indicates that the effect is particularly strong in relatively poor regions, based on regional economic data from Germany. However, the Authors observed that the coefficient is positive but insignificant for the market share of cooperative banks, and the coefficient of the interaction term is negative and insignificant. This indicates a weak association between higher market share of credit cooperatives and higher growth rates of new business registration. El HanchaSfar and Ben Ouda (2016) analysed 88 regional cooperative banks in France, which operated in 26 different regions during the period from 2006 to 2012. Their study does not suggest that cooperative banks provide more advantages compared to conventional banks. It does, however, establish their positive impact on economic growth. Also Bernini and Brighi (2018) admit that the presence of cooperative banks influences local development. However, they demonstrate a negative relationship between the development of local economies and the number of cooperative banking outlets [10].

According to the research of the Polish market conducted by Hasan et al. (2017), cooperative banks' strong positions favour creation of new businesses and weaken financing constraints for SMEs. Consequently, local markets with a pronounced presence of cooperative banks promote SME investment and growth. The same Authors (2019) observe that the increase in the number of cooperative banks reduces unemployment growth and stimulates long-term growth for SMEs. The changes that strengthen the position of local cooperative banks, and presumably privilege the use of the relationship banking model, have positive consequences for SMEs' access to debt and investment.

Therefore, we propose the following hypothesis:

Hypothesis 1: The presence of cooperative banks does not stimulates local development in the municipalities of the Podlaskie Voivodeship in Poland.

Results. The research included all 118 municipalities in the Podlaskie Voivodeship, of which 13 were urban municipalities, 27 were mixed urban-rural municipalities and 78 were rural municipalities. Podlaskie is one of 16 Polish Voivodeships, with an area of 20 187.02 km^2 and 1 181.5 thousand inhabitants. The voivodeship was chosen for analysis because of its predominantly rural character and a relatively well developed operation of cooperative banks. Agricultural production in the region is suited to relatively unfavourable natural conditions: the shortest vegetation period in the Polish lowlands and the relatively poor quality of soil. In spite of the lowest level of Agricultural Production Space Valuation Ratio in Poland, the voivodeship has the third livestock density (second for family-owned farms), and is the second largest producer of milk. In 2018, the farming character of the region resulted in its remote tenth position nationally in terms of per capita wealth (Wspólnota, 2019). In spite of systematic growth, the area's per capita GDP is only 50% of the EU average (Eurostat, 2019). The region can therefore be considered relatively poor in the context of the EU 28.

Table 2 – Correlation matrix for selected variables

Variables	REV	OWNREV	POP	REG	SAL	UNEMP	BANK	CCB	BANKBRANCH	CCBBRANCH	EFFECT
REV	1,000										
OWNREV	0.604*	1.000									
POP	0.694*	0.413	1.000								
REG	0.645*	0.392	0.694*	1.000							
SAL	-0.142	-0.110	-0.276	-0.163	1.000						
UNEMP	-0.033	-0.184	-0.211	0.089	0.207	1.000					
BANK	0.026	0.028	0.018	-0.177	-0.094	-0.097	1.000				
CCB	-0.023	-0.081	0.148	-0.184	-0.108	-0.167	0.812*	1.000			
BANKBRANCH	0.052	0.015	0.076	-0.137	-0.082	-0.087	0.902*	0.854*	1.000		
CCBBRANCH	0.065	-0.009	0.117	-0.092	-0.114	-0.080	0.777*	0.808*	0.942*	1.000	
EFFECT	-0.022	-0.137	-0.044	-0.171	-0.088	0.054	0.617*	0.609*	0.601*	0.589*	1.000
*The level of the correlation coefficient is significant at the 50% level or better.											

On 30 June, 2019, there were 30 cooperative banks operating in the voivodeship, plus one bank with its headquarters in the neighbouring Varmian-Mazurian Voivodeship. The banks have 138 branches in the analysed area. The research excluded 31 contact points, which provide only a limited range of services. There are 22 commercial banks operating in the voivodeship, with the total of 392 outlets [11].

The time framework for the research was determined by Poland's accession into the European Union in 2004, and the year 2018, i.e. the last year for which financial reports of cooperative banks were available, and economic and social data were published.

In order to evaluate whether the presence of cooperative banks stimulates local development in the municipalities of the Podlaskie region, we estimated the following model based on the research by Coccorese and Shaffer (2018) and Palacín-Sánchez and Di Pietro (2016). The design was modified in order to adapt it to the conditions of operation of cooperative banks in the Polish banking sector:

$$GROWTHVAR_{jt} = \beta_0 + \beta_1 CCB + \beta_2 BANK + \beta_3 CCBBRANCH + \beta_4 BANKBRANCH$$

$$+ \beta_5 EFFECT + \phi_i + \varepsilon_i, \tag{1}$$

where $GROWTHVAR_{it}$ is the growth rate of the variable representing the social and economic performance of the municipality i(i= 1, …, n) from 2004 to 2018, *CCB* is the number of cooperative banks in the municipality, *BANK* is the number of commercial banks in the municipality, *CCBBRANCH* is the number of cooperative banks' branches in the municipality, *BANKBRANCH* is the number of commercial banks' branches in the municipality, *EFFECT* is the number of efficient cooperative banks in the municipality, ϕ_i represents the unobservable individual effects, and ε_i is an error term.

As dependent variables, we employ six measures of local performance: the growth rate of total revenue of the municipal budget (*REV*), the growth rate of own revenue of the municipality (*OWNREV*), the population growth rate (*POP*), the growth rate of the number of registered businesses (*REG*), the growth rate of average salaries (*SAL*), and the growth rate of unemployment (*UNEMP*).

Table 1 provides some descriptive statistics of the above variables, while table 2 shows their correlations [12].

The programme Statisticaver. 13.3.byStatSoftPolska was used for calculations.

The Data Envelopment Analysis (DEA) was used to determine the efficiency of cooperative banks. DEA is a deterministic method. It assumes lack of the random component and does not require functional dependency between inputs and outputs. DEA is based on the concept of efficiency by Farrel (1957), defined as the ratio between a single output and the single production input. The concept was subsequently

developed to a multidimensional form by Charnes, Cooper and Rhodes (1978), whose CCR model includes constant returns to scale, and by Banker, Charnes and Cooper (1984), whose BCC model includes variable returns to scale. The key element of the method is the determination of an efficiency curve (a production frontier). The relative efficiency of a Decision Making Unit is approximated as the Unit's distance from the empirically determined production frontier. The efficiency measure of the units located on the frontier equals 1. Those units are efficient in the analysed sample. For the objects below the production frontier, the value of the measure is below 1 and it indicates the level of their relative inefficiency. DEA models are classified according to two criteria: orientation and returns to scale. Depending on the model's orientation, it allows to calculate input-oriented technical efficiency or output-oriented technical efficiency. Because of the specific characteristics of this research, the output-oriented variant was chosen [13].

The key problem in DEA empirical research is the correct definition of inputs and outputs in banking operation (Ahn and Le, 2014; Luo et al., 2012, Holod and Lewis, 2011). Current literature quotes five basic approaches towards the definition of the role of bank's behaviour and the definition of its operation: the production approach, the intermediation approach, the assets approach, the value added approach, and the user cost approach (Pawłowska, 2005). Obafemi (2012) ads the sixth - modern approach. Literature also presents other classifications, limited only to the production approach and the intermediation approach, and treating the rest of approaches as variants of the two main ones (Fethi, Pasiouras, 2010). In this research we estimated the efficiency measures on the basis of original expert classification of inputs and outputs, which results from the specific characteristics of the way cooperative banks operate. We accounted for the fact that in the conditions of market competition, obtaining a deposit or granting a credit is a result of activity. We considered the following as inputs: Tier 1 capital (x1), fixed assets (x2), and the bank's operating costs (x3). We considered the following as outputs: credits (y1), deposits (y2), and net profit (y3).

One of the DEA method's main limitations is its sensitivity to atypical observations, which distort the estimation of efficiency (Halkos and Petrou, 2019; Liu et al., 2010). Expert analysis was conducted in order to eliminate the non-homogenous sample. Four banks were removed from the analysed sample. Eventually, efficiency measures were obtained for 27 cooperative banks, of which 9 proved to be efficient (table 3).

Frontier Analyst Application ver. 4.4.0 by Banxia® Software was used for calculations [14].

The presented methodology is not without its limitations that may influence the final results. Firstly, the location of banking outlets is dictated by attractiveness of the place, presence of competition, potential of target customers, demographic data etc. Therefore, there is certain coexistence and interaction between local development and the number of banking outlets. On the one hand, the presence of a bank may contribute to the development of the local community. On the other, local development may influence the decision to create or maintain a banking outlet in a particular location. As much as the location of a banking outlet can be a reason for local development, it can also be its result. Secondly, people in small local communities prefer to retain anonymity, as far as financial matters are concerned. They often decide not to use their local outlets, particularly in the case of relatively large deposits or credits. Thirdly, farmers usually use loans granted on preferential terms, with subsidised interest or partial repayment by government agencies, such as the Agency for Restructuring and Modernisation of Agriculture, the National Fund for Environmental Protection and Water Management etc. Those loans can be granted by commercial banks. Furthermore, certain commercial banks, such as BNP Paribas SA, BPS SA, and SGB Bank SA, specialise in financing agricultural production and food processing. The fourth consideration is the dynamic digitalisation of banking services and products, which means that close location of a banking outlet plays lesser role than it did a few years ago. Increasingly, members of generations Y and Z use mobile devices to contact their bank or make direct payments. Also, young people often study in academic institutions, which are usually located in larger Polish cities. This gives them access to several commercial banks, even though according to official records they remain inhabitants of their home municipality. Finally, the number of banking outlets in individual municipalities is determined mainly by the presence of Bank Pocztowy S.A. (the Postal Bank). Thanks to its strategic investor, the Polish Post, the bank has access to one of the largest commercial networks – the post offices. Those outlets were treated in the research as branches of a commercial bank [15].

In order to minimise the above limitations, the research takes into account the presence of commercial banks in individual municipalities and the number of their outlets. Furthermore, the analysis includes not only the dynamics during the years 2004-2018, but also the values of individual variables at the end of 2018. Furthermore, we have evaluated the efficiency of cooperative banks. A robust cooperative bank in a local community can effectively compete with commercial banks, trying to maintain its base of strategic clients. In the analysed period of 15 years, a lot of commercial banks ended their operation in Poland as a result of mergers and acquisitions, or for other reasons. Location and number of outlets changed continuously, particularly in the case of commercial banks. All changes of this type contribute to migration of clients. Cooperative banks' networks are more stable, due to the existing regulations. All this means averaging of positive and negative tendencies in customer migration to and from cooperative banks. In addition, in order to eliminate the influence of the Postal Bank upon the results, auxiliary calculations were conducted, in which Postal Bank's outlets were not included [16].

Discussions. Contrary to earlier results, the analysis did not show any significant influence of cooperative banks upon the local development of 118 municipalities in the Podlaskie Voivodeship. The prognostic value of the constructed model was low, with insignificant parameters. The R^2 coefficient of determination indicated lack of correlation between variables, and amounted to between 0.2085 and 0.0334. The situation was similar when we estimated the correlation between the dynamics of selected socio-economic variables and the independent variables: *CCB, BANK, CCBBRABCH, BANKBRANCH* and *EFFECT*, after eliminating the outlets of Bank Pocztowy S.A. from the sample of commercial banks.

Table 3 – Efficiency of cooperative banks in the Podlaskie Voivodeship

DMU	x1	x2	x3	y1	y2	y3	Efficiency
1	21 299	2 723	68.04	67 259	178 977	904	40.7%
2	11 334	1 133	57.12	81 587	100 208	1493	100.0%
3	9 193	1 690	65.45	79 075	133 585	860	82.4%
4	63 270	6 413	53.36	434 864	566 437	5378	100.0%
5	26 054	4 078	65.91	171 994	251 700	2017	65.9%
6	12 805	801	72.02	87 633	123 838	881	81.9%
7	13 308	997	71.54	74 689	121 297	965	74.6%
8	11 545	1 497	70.52	44 206	72 260	712	49.8%
9	8 084	1 201	70.01	42 432	73 258	435	48.4%
10	9 826	687	73.75	46 508	63 380	476	53.6%
11	31 280	4 838	63.70	194 098	318 505	2419	67.1%
12	8 078	220	61.99	16 622	32 975	570	100.0%
13	12 057	771	65.93	63 816	109 488	1051	93.7%
14	24 995	7 087	73.11	250 066	401 307	2148	79.5%
15	30 461	1 159	57.99	150 681	243 048	2185	100.0%
16	8 241	146	53.88	21 665	38 493	409	100.0%
17	32 620	6 862	45.10	294 771	407 348	3846	100.0%
18	22 801	3 615	65.27	112 108	213 459	1234	49.0%
19	21 815	1 246	65.22	96 725	161 669	1584	82.4%
20	27 366	1 270	64.62	216 788	287 968	961	100.0%
21	5 828	60	83.48	8 932	37 467	169	100.0%
22	23 139	2 963	66.19	125 999	249 204	1525	58.8%
23	13 506	3 058	81.65	96 194	163 475	740	58.7%
24	29 860	3 228	56.42	438 086	615 895	3202	100.0%
25	8 164	358	68.15	40 106	58 910	489	83.5%
26	20 231	4 524	69.92	188 710	312 012	1576	74.8%
27	22 286	4 097	79.21	168 197	316 745	1381	68.9%

It was possible to identify the significant variables with a high level of the R^2 coefficient of determination during an analysis of the existing levels of selected socio-economic parameters in the municipalities of the Podlaskie Voivodeship in 2018 (tables 4 and 5). The values of the Student's t-distribution (at the significance level of 0.05) lead to the rejection of the hypotheses according to which *BANK* and *BANKBRANCH* do not influence the municipality's population *POP*; that *CCB*, *BANK* and *BANKBRANCH* do not influence the number of businesses in the municipality *REG*; and that *BANKBRANCH* does not influence the level of unemployment in the municipality *UNEMP*. After the elimination of the outlets of Bank Pocztowy SA, the values of Student's t-distribution (at the significance level of 0.05) lead to the rejection of the hypotheses according to which *CCB*, *BANK*, *CCBBRANCH* and *BANKBRANCH* do not influence the level of *POP*, *REG* and *UNEMP*. However, it is important to note that, in the case of the selected socio-economic parameters, it is the location of cooperative banks that is determined by the potential and development of individual municipalities, rather than vice versa. The negative values of indicators for the number of banks in individual municipalities and at the same time the positive values for the number of outlets can be explained by the fact that competition from the outlets of the same sector is not feasible in a local community. Cooperative banks operate within the traditional deposit and credit model. They can improve their profits only via an unhealthy competition within the same customer segments and sectors of the economy, which leads to lowering profits. Furthermore, cooperative banks with headquarters in other municipalities are reluctant to invest resources in the development of neighbouring municipalities [17-19].

Table 4 – Estimation results: basic models with the statement at the end of 2018

Specification N=118	Dependent variable					
	REV	*OWNREV*	*POP*	*REG*	*SAL*	*UNEMP*
Constant	–	–	45,9036 (5,2752)	3,2762 (0,5684)	–	1,5665 (0,2384)
CCB	–	–	–	-2,6856 (1,0788)	–	–
BANK	–	–	-10,6323 (1,6542)	-2,1605 (0,1782)	–	–
CCBBRANCH	–	–	–	–	–	–
BANKBRANCH	–	–	27,6781 (0,8545)	3,3824 (0,0921)	–	0,7189 (0,0386)
EFFECT	–	–	–	–	–	–
R²	–	–	0.9887	0.9909	–	0.9693

Table 5 – Estimation results: basic models with the statement at the end of 2018 without Bank Pocztowy SA

Specification N=118	Dependent variable					
	REV	*OWNREV*	*POP*	*REG*	*SAL*	*UNEMP*
Constant	–	–	40,6370 (6,5664)	2,6285 (0,6803)	–	1,3959 (0,2828)
CCB	–	–	-34,2054 (12,2415)	-4,5984 (1,2684)	–	-1,3383 (0,5273)
BANK	–	–	-22,2605 (2,1555)	-3,5379 (0,2233)	–	-0,3520 (0,0928)
CCBBRANCH	–	–	40,1494 (8,7451)	4,8328 (0,9061)	–	1,3789 (0,3767)
BANKBRANCH	–	–	39,0008 (1,5676)	5,0184 (0,1624)	–	0,9300 (0,06752)
EFFECT	–	–	–	–	–	–
R²	–	–	0.9825	0.9869	–	0.9569

Also the presence of an efficient bank in a municipality has principally no bearing upon any of the analysed parameters. This may indicate that efficient cooperative banks basically adopt the operating model of commercial banks and try to emulate their strategies. Concentrating on profit does not necessarily translate into benefits for the local community. It is important for a cooperative bank to produce net profit necessary for increasing equity and improving capital adequacy. However, orientation towards profit may harm actually acting in the interest of the stakeholders.

We believe that the lack of connection between the presence of cooperative banks and the dynamics of the selected socio-economic parameters in the Podlaskie municipalities can be explained by completely different conditions in which cooperative banks operate today, compared to the earlier research. The timeframe of the analysis included the time until 2018, i.e. a period when taxes and regulatory fees diametrically increased throughout the banking sector. Consequently, even though the statutes of cooperative banks provided for funding local cultural, educational, sporting needs etc., the banks focused on increasing their current reserves, capital reserves, and general risk funds to cover unidentified types of banking risk. Thus the assets devoted to sustainable development of local communities became significantly limited. Please note that, unlike in other countries, the membership in Polish cooperative banks becomes less and less popular, and membership numbers dwindle. Equity capital of cooperative banks, which is created chiefly by in-payments from members, suffers as a result [20-25].

Another reason for cooperative banks' lack of support for local communities is a certain alternation of their operating strategies. The dynamic changes in their environment force the management of cooperative banks to change their business orientation. It becomes less and less possible to maintain market position by applying an extensive business model, based mainly on interest margins. Until recently, cooperative banks cultivated a costly business model dependent on a relatively large number of banking outlets and high employment. This model is reflected in far lower cost effectiveness, lower staff productivity, and less effective customer acquirement, compared to commercial banks. According to M. Idzik (2018), an average age of a cooperative bank customer in the second quarter of 2018 was 52 years, compared to 43 years in the case of the customers of commercial banks. This results in relatively smaller activity of cooperative clients in terms of using banking cards (38%), savings accounts (10%), credit cards (11%), term deposits (13%), currency accounts (4%), online banking (26%) and mobile banking – usually in a different bank than the cooperative one (11%). Customer activity is at least 50% lower than in the case of commercial banks. With the current pace of changes in the market environment, and the digitalisation of banking products and services, cooperative banks operating as fully separate entities will be forced into losing positions as they try to compete in all areas of operation with far stronger commercial banks, unless they change their existing methods of management [26]. The cooperative sector can effectively compete with commercial banks if it becomes more integrated, and if the products, computer infrastructure and marketing are uniformly managed at the level of a cooperative bank association. The cooperative banks' only chance of survival (apart from occupying the niche of clients expecting flexibility and fast decision making, in which commercial banks are less interested) is to find products, services and manners of contacting clients, which are not offered by commercial banks. Answering this challenge is crucial for the future of the cooperative banking sector and its role in local communities. Another solution is a French-style consolidation, and creation of a bank operating according to commercial principles [27].

Contrary to earlier research, the analysis showed no significant influence of cooperative banks upon the local development of 118 municipalities in the PodlaskieVoivodeship. We believe that the lack of influence of cooperative banks upon the dynamics of the selected socio-economic parameters in those municipalities is mainly a result of the entirely different conditions of cooperative banks' operation, compared to the earlier research. Cooperative banks face serious regulatory, technological and demographic challenges, which they must overcome, or be pushed out of the market. Unfortunately, this situation is reflected in the cooperative banks' decreasing participation in financing the needs of local communities. More research is necessary to refine and further elaborate on our new findings.

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ПОЛЬШАДАҒЫ ПОДЛЯСКОЕ ВОЕВОДСТВОСЫНЫҢ ЖЕРГІЛІКТІ ДАМУЫНА КООПЕРАТИВТІК БАНК БӨЛІМШЕЛЕРІНІҢ ӘСЕРІ

Аннотация. Жұмыстың мақсаты Польшадағы Подляское воеводасының муниципалитеттерінде кооперативті банктердің болуы жергілікті дамуды ынталандыратындығын бағалау болып табылады. Осы мақсатта біз 118 муниципалитеттегі кооперативті банктермен жекелеген әлеуметтік-экономикалық фактор-лардың өзгеру динамикасы: жекелеген муниципалитеттердің жиынтық және меншікті кірістері, халықсаны, кәсіпорындар саны, орташа айлық жалақы және жұмыссыздық деңгейі арасындағы байланысты қарас-тырдық. Талдау Польшаның Еуропалық Одаққа кіруімен 2018 арасындағы кезеңді қамтиды. Біздің нәти-желеріміз кооперативті банктермен жергілікті даму арасындағы тығыз байланысты көрсететін бұрынғы тұжырымдарды растамайды.

Түйін сөздер: банк секторы, кооперативті банктер, жергілікті экономикалық өсу, DEA (жұмыс істеу ортасын талдау).

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ВЛИЯНИЕ ОТДЕЛЕНИЙ КООПЕРАТИВНЫХ БАНКОВ НА МЕСТНОЕ РАЗВИТИЕ ПОДЛЯСКОГО ВОЕВОДСТВА В ПОЛЬШЕ

Аннотация. Целью работы является оценка того, стимулируют ли кооперативные банки местное раз-витие в муниципалитетах Подляского воеводства в Польше. Для этой цели мы изучили связь между кооперативными банками в 118 муниципалитетах воеводства и динамикой изменения отдельных социально-экономических факторов: общих и собственных доходов отдельных муниципалитетов, численности населе-ния, количества предприятий, среднемесячной заработной платы и уровня безработицы. Анализ охватывает период между вступлением Польши в Европейский Союз и 2018 годом. Наши результаты не подтверждают ранее сделанные выводы, свидетельствующие о тесной связи между кооперативными банками и местным развитием.

Ключевые слова: банковский сектор, кооперативные банки, местный экономический рост, DEA (ана-лиз среды функционирования).

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