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SPIS TREŚCI

Lista Recenzentów	5
<i>Joanna Bereźnicka, Justyna Franc-Dąbrowska</i> SOURCES AND DETERMINANTS OF CASH HOLDINGS IN THE AGRICULTURE IN CENTRAL AND EASTERN EUROPE COUNTRIES AND THE PERSPECTIVE OF FINANCIAL SECURITY OF POLISH FARMS	7
<i>Katarzyna Boratyńska</i> A SCALE OF CORPORATE BANKRUPTCIES DURING THE COVID-19 PANDEMIC	23
<i>Dorota Burzyńska</i> TAX JURISDICTION OF COMMUNES IN POLAND AND METHODS OF ITS IMPLEMENTATION	35
<i>Agnieszka Ginter</i> PROVIDING OF ENVIRONMENTAL BENEFITS BY SMALL FARMS IN REGIONAL PERSPECTIVE-THE SELECTED PROBLEMS	51
<i>Marlena Grzelczak</i> SOCIO-DEMOGRAPHIC FACTORS AND UBANKING OF THE POLISH SOCIETY	63
<i>Liubov Gutsalenko, Uliana Marchuk, Serhiy Zabolotnyy, Oleksandr Hutsalenko,</i> THE EVOLUTION OF THE ENERGY SYSTEMS OF UKRAINE AND THE ORGANIZATION OF MANAGEMENT ACCOUNTING IN ENERGY COMPANIES	79
<i>Sławomir Juszczak, Łukasz Mleczko, Wioleta Bartosiak, Bartosz Kublik</i> MACROECONOMIC FACTORS AS TOOLS FOR STIMULATION OR DESTIMULATION OF AGRIBUSINESS LOANS IN CRISIS SITUATION	93
<i>Iwona Kowalska</i> OPERATING SURPLUS OF LGUS IN THE CONTEXT OF LEGAL CHANGES RESULTING IN A DECLINE OF LGUS' CURRENT INCOME FROM PIT	105
<i>Renata Marks-Bielska</i> AGRICULTURAL LAND AS A PUBLIC GOOD	119
<i>Agnieszka Skoczylas-Tworek</i> FRAUD RISK IN TIMES OF CRISIS AND THE DEVELOPMENT OF ITS MITIGATION TOOLS	129

<i>Cezary Szydłowski</i> ASSESSMENT OF THE SHARE OF REAL ESTATE TAX REVENUES IN BUDGET REVENUES OF SELECTED POLISH CITIES IN 2018-2021	141
<i>Hasan Bilgahan Yavuz, Agnieszka Parlińska</i> THE RELATIONSHIP BETWEEN ECONOMIC GROWTH AND MIGRATION IN TERMS OF 14 EUROPEAN UNION COUNTRIES AND TURKEY	163
<i>Magdalena Ziolo, Katarzyna Wójtowicz</i> POLISH LOCAL SELF-GOVERNMENT AGAINST CHALLENGES CREATED BY THE RISK OF NON-FINANCIAL FACTORS (ESG).....	179

Lista Recenzentów (nr 27 i 28)

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SOURCES AND DETERMINANTS OF CASH HOLDINGS IN THE AGRICULTURE OF CENTRAL AND EASTERN EUROPE COUNTRIES AND THE PERSPECTIVE OF THE FINANCIAL SECURITY OF POLISH FARMS

Ensuring business continuity requires maintaining financial liquidity and a certain level of cash holdings. This also applies to farms whose owners obtain funds from various sources, including foreign capital. For this reason, the study aimed to identify sources and determine cash resources in farms in Central and Eastern European countries that are in the EU. Additionally, based on detailed data from Polish farms, we assessed and compared the importance of cash holdings in farms characterised by a high level of financial security and those for which we identify the bankruptcy risk. Data for the research is from the Farm Accounting Data Network (FADN) database for 2013-2018 (for all the EU countries we consider). In the analysis touching upon bankruptcy risk in Polish farms, we used data from FADN-PL for 2010-2018. In the study, we used the panel method – weighted least squares method (WLS). We applied the dynamic approach to calculate the cash holdings. Inferences from our study indicate that budget support for farmers and sales value per farm are the main sources and determinants of cash holdings in farms in New Member State of the EU. It should be underlined that the influence of budget support on cash holdings in Polish farms was weaker than in other surveyed countries. Moreover, it was found that the level of indebtedness was also an important factor that impacted cash holdings. On Polish farms, the impact of the debt level on cash holdings was negative, and in other countries – positive. The added value of work is identifying factors that affect cash holdings changes, so it is a dynamic approach to cash holdings.

Keywords: cash holdings, panel regression, farms, developing country EU

JEL codes: G30, D25

Introduction

The fundamental objective of every economic enterprise is its smooth running and development. To ensure an enterprise's financial security¹ and the possibility of continuous

¹ Financial security is a narrower yet fundamental synonym of economic security. In the description of economic security by the World Economic Forum, most economic risk factors concern the financial sphere, e.g., chronic fiscal imbalance, extreme energy price fluctuations, and in agriculture: permanent financial imbalance, repetitive liquidity crises, a high level of income disproportions, uncontrollable inflation or deflation (Global Risks 2013 Eight Edition, World Economic Forum, Committed to Improving the State of The World, World Economic Forum, Switzerland 2013). The financial security of an enterprise is a key element of the economic security system. Generally, the financial component constitutes the basic value of level and structure of an entity's financial potential to ensure the means for economic development (e.g., B.O. Tursunov: Aspect of Financial Security of

activity, it requires funds, so it “demands money”. The source of such funds may differ (i.e., internal and external financial sources). According to Jensen’s theory, firstly, our own internal or external sources are used up, and then foreign, external sources. The amount of cash held is shaped by the differing needs of an enterprise. In 1936, Keynes highlighted this aspect by defining financial liquidity. At the same time, Keynes identified transactional motives and precautionary and speculative purposes for holding cash. From the perspective of the basic running of a company, it seems that the first two motives are the most important to ensure a family’s financial security (the household).

The problem of cash holdings is not a new notion. Yet, it is also worth indicating that matters concerning it have been considered from the perspective of entities functioning outside agriculture and focused on stock market companies as well as S&M enterprises. The issue of cash holdings in the agricultural sector was raised by Singh and Misra², but the authors focused their attention on Indian agribusiness entities, not farms. The issue of cash holdings in farms is interesting because, according to Aditya R. Khanal and Omobolaj Omobitan³, farmers’ access to capital is constrained in multiple ways and the financial performers of credit constrained small farmers was significantly lower than that of unconstrained small farmers – an adverse impact of constrained capacity to credit could lower in gross farm sales. In such conditions – restrictions on crediting – Polish farmers function in particular. A strong argument for undertaking this research is also the fact that we suggest a dynamic approach to cash holdings, which is not as widely discussed in the literature. This is why we believe that research in the scope of cash holdings contains research gaps which we would like to fill. Agriculture, which we fail to associate with the farming industry, is an area in which there are limitations to raising external financing (e.g., on the capital market). On the other hand, farmers receive budget support. We would also like to examine the extent to which state aid is an essential financial source for farms.

The research aims to define the sources as well as the determinants of cash holdings. The research concerned agriculture in Poland as well as Central and Eastern European countries belonging to the EU (called ‘developing countries’⁴) and also farms divided into two groups: 1) those at risk financially and 2) those not at risk financially (secure).

Due to the fact that research concerns two aspects of cash holdings, two hypotheses have been made:

H₁: Budget support, the essence of which is to compensate farmers for lost income, is a determinant that positively affects cash resources in both Poland and Central and Eastern European countries despite variations in the level of this support.

H₂: Cash holdings in farms are positively affected by the value of sales in a situation where there is no deferred payment.

Industrial Enterprises Under Influence of Global Crisis, *Asian Journal of Technology & Management Research* 10, 01/2020, p. 116-122).

² K. Singh, M. Misra: Financial determinants of cash holdings levels: An analysis of Indian agricultural enterprises, *Agricultural Economics-Czech*, 65 (5)/2019, p. 240-248.

³ A.R. Khanal, O. Omobitan: Rural Finance, Capital Constrained Small Farms, and Financial Performance: Findings from a Primary Survey, *Journal of Agricultural and Applied Economics*, 52, 2/2020, p. 288-307. <https://doi.org/10.1017/aae.2019.45>

⁴ J. Franc-Dąbrowska: Crawling financialization in Central and Eastern Europe – on the example of Agriculture, *Economia Agro-Alimentare* 21, 3/2019, p. 1-19, <https://doi.org/10.3280/ECAG2019-003006>

H₃: Among the negatively impacting determinants of cash holdings in farms at risk of going concern are those of external foreign funds, regardless of the term of the loan.

Data and method

The data used in calculations was from (1) the database organised for collecting accounting data for Polish farms FADN.pl, and for (2) Central and Eastern European countries – the European FADN database. The study period covered 2010-2018 (for Polish farms); for developing countries, this period covered 2013-2018⁵. For developing countries, the year 2013 was selected as other countries have not accessed the EU since this year. The collected data facilitated the design of two balanced panels for Poland (A) and developing countries (D). This was the first stage of the study. In the second stage, two further unbalanced panels were distinguished (using Altman's⁶ Z-score) for farms not at risk (B) and at risk (C). Farin et al.⁷ applied a similar method of distinguishing panel data. Finally, the following groups were distinguished: Group (A), counting 40,536 Polish farms as part of the balanced panel, Group (B), encompassing 15,979 farms, Group (C), in which 5,052 farms were analysed as well as Group (D), constituting a panel describing the agriculture of 11 countries over six years and belonging to the EU (balanced panel).

Research hypotheses – in accordance with the rules – were proven with the application of panel data. Panel data is useful in such research as such data enables the testing of hypotheses with the help of cross-sectional analyses⁸. To model the data, model panels were applied. In order to ensure the proper selection model, we used Breusch-Pagan's and Hausmann's test analyses. The test results are presented in Table 1.

Table 1. Breusch-Pagan and Hausman tests verifying research appropriability for distinguished panels

Details	Poland – panel (A)	Unthreatened farms – panel (B)	Farm at risk – panel (C)	Developing countries – panel (D)
Breusch-Pagan test (χ^2)	14230.1265	1652.3219	1462.3222	7.2372
p-value	2.35e-025	5.32e-014	4.68e-09	0.0007
Hausmann test (χ^2)	290.1211	170.3632	120.5854	75.9596
p-value	3.21e-012	2.36e-029	2.95e-017	2.4351e-014
Number of object in the panel	40,356	15,978	5,052	66

Source: own elaboration based on FADN data, with the application of Gretl; version 1.9.3.

⁵ The 11 countries of Central and Eastern Europe belonging to the EU, called developing countries, were: Poland, Slovakia, Slovenia, the Czech Republic, Croatia, Hungary, Bulgaria, Romania, Lithuania, Latvia and Estonia.

⁶ The rationale behind the use of the Altman model was that it was developed for the purpose of diagnosing the risk of bankruptcy of companies operating in emerging markets, and therefore less developed than the US economy (see Pawłowski, M.: Modele dyskryminacyjnej ocenie ryzyka wpadłości emitenta obligacji korporacyjnych. *Polityki Europejskie, Finanse i Marketing*, 19 (68)/2018, p. 211-222, <https://doi.org/10.22630/PEFIM/2018.19.68.18>). And the tested objects fit the model's assumptions.

⁷ J. Farinha, C. Mateus, N. Soares: Cash holdings and earnings quality: evidence from the Main and Alternative UK markets, *International Review of Financial Analysis* 56/2018, p. 245.

⁸ P.J. García-Teruel, P. Martínez-Solano: On the Determinants of SME Cash Holdings: Evidence from Spain. *Journal of Business Finance & Accounting*, 35(1), (2)/2008, p. 127-149, <https://www.doi.org/10.1111/j.1468-5957.2007.02022.x>

In the group of Polish farms (A), there was a high value of chi-square statistics, which indicates a high level of heteroscedasticity of variables and proves that a better solution would be to use a simple method (the weighted least squares method). This was also confirmed by the Hausman test, which indicates that it would be unfounded to apply the random effects model. In the case of the panel of developing countries (D) the statistic value of the chi-square test of Breusch-Pagan indicates the possibility of applying the estimation method with specified effects. Considering the aforementioned, we decided to apply the weighted least square method for all data panels to compare results later. The general shape of the model of weighted least square methods may be presented per the following formula:

$w_i y_i = \beta_0 w_i + \beta_1 (w_1 x_{1i}) + \beta_2 (w_2 x_{2i}) + \dots + \beta_k (w_k x_{ki}) + \varepsilon_i$ for $i = 1, 2, 3, \dots, n$
The weights are indicated according to the formula⁹:

$$w = \frac{1}{\sqrt{\sigma_i^2}}, \text{ where } \sigma_i^2 = e^{\widehat{\ln}(e_i^2)}$$

The dependent variable in the model is the liquidity reserve defined as funds which farmers have at their disposal to implement all transactions connected with running a farm and shall be presented per the following formula:

$$\Delta \text{cash} = \text{cash}_{t-1} + \text{Cash Flow (CF)}_t$$

Referring to our considerations, in general, it is possible to present the regression equation in the following way:

$$\Delta \text{cash} = \beta_0 + \beta_1 CF/TA + \beta_2 \text{ subsidies} + \beta_3 \text{ short-term debt (S-TD)} + \beta_4 \text{ long-term debt (L-TD)} + \beta_5 \text{ sales} + \beta_6 LIQ + \beta_7 LEV + \beta_8 \text{ debt maturity} + \varepsilon_i$$

Whereby:

CF/TA = total cash flows/ total asset value (asset cash yield),

LIQ = (Working capital – funds)/Total assets,

LEV = Total debt/Own capital,

Debt maturity – Short-term debt/Total debt.

This is not a standard process when analysing cash holdings as the static approach is most commonly applied, while reserves constitute liquidity reserve resources (i.e., funds and their equivalents¹⁰). It is not, however, the only way of doing it as, for example, Isshaq and Bopkin¹¹ measured liquidity 1n of funds and the securities market, while – for example

⁹ B. Borkowski, H. Dudek, W. Szczesny: *Ekonometria. Wybrane zagadnienia*, Wydawnictwo Naukowe PWN, Warszawa 2003, p. 122.

¹⁰ A. Ozkan, N. Ozkan: Corporate cash holdings: an empirical investigation of UK companies, *Journal of Banking and Finance*, 28 (9)/2004, p. 2103-2134; E. Levitas, M.A. McFadyen: Managing liquidity in research-intensive firms: signaling and cash flow effects of patents and alliance activities, *Strategic Management Journal*, 30/2009, p. 659-678; R. Bansal, V. Bansal: A Research Paper on Determinants of Corporate Liquidity in India, *International Journal of Marketing and Technology*, 2, 4/2012, p. 103-117.

¹¹ Z. Isshaq, G.A. Bokpin, J. Mensah Onymah: Corporate governance, ownership stucture, cash holdings, and firm value on the Ghana Stock Exchange, *Journal of Risk Finance*, 10, 5/2009, p. 488-499, <https://doi.org/10.1108/15265940911001394>

– Chen and Mahajan¹², or Chen and Yo¹³, measured interest of liquid reserves to non-cash assets. The LIQ, LEV and debt maturity indexes were designed according to the suggestions of García-Teruel and Solano¹⁴. Their significance in cash holdings studies can be found in publications of such researchers as Cai et al.¹⁵, as well as in studies by Angelovska and Valentinčič¹⁶, but LIQ is calculated as net working capital minus cash divided by net assets.

The suggested solution is a non-standard procedure in defining cash holdings, but facilitates presenting the changes in the value of cash held in various periods. It results from this that, on farms (in Poland), nobody keeps a record nor distributes cash between farms (in Poland) and households. Our approach to cash holdings is similar to that of Muncef Guizani¹⁷, who suggests a dynamic approach to carrying out research into cash holdings, taking the changes in the level of cash held in further years into consideration.

The independent variables are characterised by sources of financing (i.e., subsidies, sales, long-term and short-term loans, as well as the effectiveness of using property resources or their structure).

Literature Review

The problem of being able to run a company smoothly is not only a concern for those running farms, but also for all entrepreneurs. This is evidenced by Lian et al. and Al Amarneh, who claimed that enterprises would aim to accumulate the most liquid assets to ensure financial security, especially in times of economic slowdown or crisis¹⁸. Research carried out by the International Monetary Fund in companies belonging to G7 countries has shown that there is a growing tendency to accumulate financial assets. Similar observations were made by Trejo-Pech et al.¹⁹. The authors concluded that “many agribusiness firms held large amounts of cash relative to total assets recently” and that one reason for holding cash is to prepare for less robust operating periods. In conditions of economic lockdown, the subject of financial sources and cash holdings is ever more current and interesting from the financial security perspective of economic entities (the lack of a separate so-called “financial shield” for farms).

It can be assumed that financial security is attained when an entity disposes of

¹² N. Chen, A. Mahajan: Effects of Macroeconomic Conditions on Corporate Liquidity – International Evidence, *International Research Journal of Finance and Economics*, 35/2010, p. 112-129.

¹³ N. Chen, S. Yo: Government Deficits and Corporate Liquidity, *Asian Economic and Financial Review*, 2, 1/2012, p. 59-75.

¹⁴ P.J. García-Teruel, P. Martínez-Solano: On the Determinants of SME Cash Holdings: Evidence from Spain. *Journal of Business Finance & Accounting*, 35(1), (2)/2008, p. 127-149, <https://www.doi.org/10.1111/j.1468-5957.2007.02022.x>

¹⁵ W. Cai, Ch.C. Zeng, E. Lee, N. Ozkan, N.: Do business groups affect corporate cash holdings? Evidence from a transition economy, *China Journal of Accounting Research* 9/2016, p. 1-24.

¹⁶ M. Angelovska, A. Valentinčič: Determinants of Cash Holdings in Private Firms: The Case Of The Slovenian SMES, *Economic And Business Review*, 22, 1/2020, p. 5-36.

¹⁷ M. Guizani: The financial determinants of corporate cash holdings in an oil rich country: Evidence from Kingdom of Saudi Arabia, *Borsa Istanbul Review*, 17, 3/2017, p. 133-143.

¹⁸ A. Al-Amarneh: Corporate cash holdings and financial crisis: evidence from Jordan, *International Business Research*, 8, 5/2015, p. 212-222; Y. Lian, M. Sepehri, M. Foley: Corporate cash holdings and financial crisis: an empirical study of Chinese companies, *Eurasian Business Review*, 1, 2/2011, p. 112-124.

¹⁹ P.O. Trejo-Pech, M.A. Gunderson, T.G. Baker, A.W. Gray, M.D. Boehlje: Assessing Cash Holdings in Agribusiness, *International Food and Agribusiness Management Association*, 18, 4/2015, p. 85-105.

appropriate financial resources and has created a level of cash flow to timely cover expenses²⁰. In agriculture, budget support is a key component connected with financial security/stability. Studies conducted by Kropp and Katchova²¹ and Goodwin and Mishra²² show that agricultural policy instruments are of importance when it comes to the financial security of farms. Research by Berežnicka²³ indicates that the subsidies handed out to farmers to carry out operational activity positively impacted the financial stability of EU farms – which, in turn, strengthened financial security.

As Amess et al.²⁴ point out, in contemporary empirical analyses, the problem of endogeneity is a concern as it may lead to an incorrect evaluation of coefficients. One of the more difficult variables to estimate is, for example, the influence of various policies on funds held by an entity. It is also worth indicating that there are certain market imperfections, which means that there is an optimal level of cash counterbalancing costs and benefits and maximising a company's value. Additionally, it is necessary to consider a company's ability to generate cash and raise funds, which also influences decisions concerning the level of cash held²⁵.

The research results of Spanish SMEs between 1998-2012 confirm the existence of a target cash level that small enterprises attempt to attain. At the same time, in accordance with the precautionary motive of holding cash, SMEs with greater possibilities of growth adapt faster to the target level of cash to maintain financial flexibility and take advantage of profitable investment opportunities when they arise. Empirical evidence also shows that enterprises with financial limitations also adapt more quickly to the target cash level. Smaller enterprises and those with less internal financing (low cash flow level) are especially more likely to counterbalance the level of their own cash resources than bigger enterprises with easier access to external financing²⁶. Similar findings indicating that SMEs maintain a target cash level and adapt more easily to it were validated for 307 UK SMEs between 2000 and 2009 by Al-Najjar²⁷.

Research on cash holdings in agricultural businesses was carried out by Singh and Misra²⁸, focusing mainly on the factors that shape them. The results of these findings show

²⁰ S. Dahiya, A. Saunders, A. Srinivasan: Financial distress and bank lending relationships, *Journal of Finance* 58/2003, p. 375-399.

²¹ J.D. Kropp, A.L. Katchova: The effects of direct payments on liquidity and repayment capacity of beginning farmers, *Agricultural Finance Review*, 71, 3/2011, p. 347-365.

²² B.K. Goodwin, A.K. Mishra: Are decoupled farm program payment really decoupled? An empirical evaluation, *American Journal of Agricultural Economics*, 88/2006, p. 73-89.

²³ J. Berežnicka: Operational Subsidies and Financial Stability of Farms in the European Union, *Więś i Rolnictwo*, 3, (180)/2018, p. 113-135.

²⁴ K. Amess, S. Banerji, A. Lampousis: Corporate cash holdings: Causes and consequences, *International Review of Financial Analysis*, 42/2015, p. 421-433.

²⁵ P.J. García-Teruel, P. Martínez-Solano: On the Determinants of SME Cash Holdings: Evidence from Spain. *Journal of Business Finance & Accounting*, 35(1), (2)/2008, p. 127-149, <https://www.doi.org/10.1111/j.1468-5957.2007.02022.x>

²⁶ C. Martínez-Sola, P.J. García-Teruel, P. Martínez-Solano, P.: Cash holdings in SMEs: speed of adjustment, growth and financing, *Small Business Economics Journal*, 51 (4)/2018, p. 823-842, <https://www.doi.org/10.1007/s11187-018-9990-y>

²⁷ B. Al-Najjar: The Effect of Governance Mechanisms on Small and Medium-Sized Enterprise Cash Holdings: Evidence from the United Kingdom, *Journal of Small Business Management*, 53,(2)/2015, p. 303-320. <https://www.doi.org/10.1111/jsbm.12062>

²⁸ K. Singh, M. Misra: Financial determinants of cash holdings levels: An analysis of Indian agricultural enterprises, *Agricultural Economics-Czech*, 65 (5)/2019, p. 240-248.

that the capital expenditure rate, cash flow to assets ratio and the dividend payout rate have a positive impact on cash holdings. However, factors that negatively impact such holdings were enterprise size and market-to-book value relation.

Research results and discussion

Table 2 presents a comparison of basic descriptive statistics of independent and dependent variables divided into two groups: Polish farms (A) and developing countries of the EU (D). They facilitate the indication of differences between examined financial categories.

Table 2. Descriptive statistics for variables considered in the panel research

Variable	PANEL							
	Poland* (A)				Developing countries (D)			
	average	min	max	<i>SD</i>	average	min	max	<i>SD</i>
Δ cash [thous. EUR]	23.97	-156.73	337.18	117.24	82.22	5.94	359.39	100.34
<i>CF/TA</i> [%]	9.27	-13.39	98.98	6.76	12.13	5.09	20.60	4.19
Subsidies [thous. EUR]	10.24	0.00	113.67	46.93	30.23	1.20	158.19	42.49
<i>S-TD</i> [thous. EUR]	5.38	0.00	361.43	54.60	39.40	0.08	325.73	75.14
<i>L-TD</i> [thous. EUR]	17.67	0.00	1069.06	178.37	35.70	0.36	188.01	45.23
Sale [thous. EUR]	34.03	-0.72	706.01	190.84	100.58	8.84	484.87	134.47
<i>LIQ</i> [%]	9.85	0.00	71.70	5.67	7.90	3.67	13.03	2.35
<i>LEV</i> [%]	6.35	0.00	472.60	14.03	25.89	1.55	76.66	20.95
Debt maturity [%]	60.00	0.00	100.00	31.00	60.60	19.54	98.00	17.80

* absolute values are presented in EUR thous. While the average exchange rate assumed constitutes 4.194, calculated as the daily average exchange rates for the research period 2010-2018.

Source: own calculations based on the Polish database FADN as well as Eurostat, FADN Public Database (SO), <https://agridata.ec.europa.eu/extensions/FADNPublicDatabase/FADNPublicDatabase.html> (access: 15.10.2020); Archiwalne kursy walut – tabela kursowa. Bankier.pl, <https://www.bankier.pl/narzedzia/archiwum-kursow-walutowych> (access: 24.11.2020).

When comparing the data from Table 2, it is worth noting that Polish farms show significantly lower values and sizes of the examined variables. It has been stated that they vary greatly (high value of standard deviation). The biggest differences take place in the case of the short-term debt variable, and the most probable reason for this is that Polish farmers do not take advantage of trade credit and very rarely make use of working capital loans in comparison with their European counterparts (simultaneously this is evidence confirming risk aversion). Low levels of debt do not concern the whole collective, evidenced by very high levels of maximum debt exceeding the maximum debt value of European farms. There is a significant difference in long-term debt, and in Polish conditions, it is an amount 5-fold greater than in developing country farms. However, these comparisons confirm just how differentiated the researched collective is in this matter (standard deviation constituted 178.37). Another interesting matter concerns cash holding sources, i.e. sales and subsidies. The average values attained by Polish farms are almost 3-fold lower than those attained by the competition; however, there are some agricultural producers who have attained 2-fold higher sales compared to other farms of developing countries. What is worth noting is the change in the cash levels. In the whole period

researched, there was an average growth of cash by EUR 24,000 per farm, while in developing countries, this amount was 4-fold higher. These differences stem from the fact that negative cash flows were observed on Polish farms, a phenomenon that did not occur in other countries (D). The maximum values in both comparisons are similar to each other, though greater differentiation concerns Poland (higher value of standard deviation).

In the case of relative values, it is worth indicating that the panel Poland (A) is characterised by a lower level of financial leverage (resulting from a lower debt level) as well as the capacity of assets to make cash in comparison with the panel for farms of developing countries of the EU (D). It results from the fact that there are assets in agriculture of long-term nature, which, in the long run, are involved in the production process. A factor differentiating Polish farms from developing country farms was the effect of total negative cash flows in the former as a result of negative operational flows ($CF/TA - 13.39$). At the same time, it is worth noting that the maximum values of the total cash flows to assets ratio of Polish farms is several times higher than those for the panel of developing countries.

The interactions taking place between variables are presented in Table 3.

Table 3. Matrix of variable correlation for the Polish panel (A) (top part of the matrix) and other Central and Eastern European countries panel (D) (bottom part of the matrix)

Variable	Δ cash	CF/TA	Subsidies	$L-TD$	$S-TD$	Sale	LIQ	LEV	Debt maturity
Δ cash	1.000	0.396	0.434	0.202	0.134	0.561	0.046	0.092	0.196
CF/TA	-0.003	1.000	0.093	-0.017	-0.150	0.265	0.122	0.032	-0.004
Subsidies	0.909	-0.087	1.000	0.423	0.597	0.293	0.043	0.239	0.179
$L-TD$	0.842	-0.124	0.834	1.000	0.632	0.482	-0.047	0.712	0.377
$S-TD$	0.919	-0.039	0.903	0.790	1.000	0.429	0.004	0.591	0.080
Sale	0.907	-0.077	0.996	0.840	0.910	1.000	-0.007	0.293	0.168
LIQ	0.335	0.370	0.383	0.325	0.311	0.398	1.000	-0.026	-0.065
LEV	0.663	0.122	0.598	0.769	0.649	0.617	0.618	1.000	0.318
Debt maturity	-0.516	-0.561	-0.501	-0.305	-0.558	-0.518	-0.616	-0.463	1.000

critical value (with a 2-sided 5% critical area) constitutes 0.242 for $n = 66$ (countries) and 0.097 for $n = 40,536$ (Poland)

Source: own calculations based on the Polish database FADN as well as Eurostat, FADN Public Database (SO), <https://agridata.ec.europa.eu/extensions/FADNPublicDatabase/FADNPublicDatabase.html> (access: 15.10.2020).

The figures presented in Table 3 indicate completely different correlation relationships between variables in the other Central and Eastern European countries panel and Poland. The differences do not only concern the critical area but also the dependencies between the variables. Considering the associations of the Δ cash variable, it is worth noticing that apart from the CF/TA variable, all other variables are strongly correlated. This mainly concerns the source of funds, regardless of whether they were subsidies or debts. There is a slightly weaker correlation in the case of liquid assets. It is worth highlighting that the debt maturity variable is negatively correlated with the dependent variable, though this correlation is not strong. In the case of the Poland panel, the source

of funds also indicates decisively greater correlation values than variables constituting asset structure, capital or cash yield. What is worth noting is the quite high – for the Poland panel – coefficient correlation of the variable CF/TA to $\Delta cash$. It is also interesting to note that debt maturity shows a positive correlation with the dependent variable (contrary to the Central and Eastern European countries panel). This is most probably a result of the debt structure. In Poland, there is a big difference between the value of long-term debt and short-term debt (in favour of the former); however, in the other Central and Eastern European countries panel, these values are on a similar level (see Table 2). Due to the fact that long-term debt financing dominates in Poland, maturity should positively impact the value of funds in subsequent payment periods.

Moving on from a whole country and developing countries level to a lower level (local – Polish), Table 4 presents the descriptive statistics of variables for defined groups incorporating financial security.

Table 4. Descriptive statistics for the panel Polish farms at risk and not at risk [thous. PLN, %]

Variable	Panel							
	unthreatened (b)				endangered (c)			
	average	min	max	<i>SD</i>	average	min	max	<i>SD</i>
$\Delta cash$	115.50	-451.83	1414.53	124.23	118.38	-657.34	1349.10	136.90
CF/TA	9.83	-6.83	90.41	6.83	9.80	-13.39	68.64	6.08
Subsidies	45.30	0.00	436.48	42.52	61.12	0.00	476.70	57.90
$S-TD$	10.59	0.00	194.14	10.97	54.02	0.00	1515.83	75.30
$L-TD$	8.04	0.00	145.00	13.88	185.90	0.00	4483.65	279.20
Sale	149.45	0.00	2173.20	187.40	211.67	0.00	2960.90	231.40
LIQ	10.31	0.00	58.02	5.34	9.91	0.00	62.30	5.31
LEV	1.45	0.00	88.86	1.74	15.63	2.50	472.60	18.50
Debt maturity	30.00	0.00	100.00	32.00	70.00	0.00	100.00	23.00

Source: Source: own calculations based on the Polish database FADN as well as Eurostat, FADN Public Database (SO), <https://agridata.ec.europa.eu/extensions/FADNPublicDatabase/FADNPublicDatabase.html> (access: 15.10.2020).

The change of source of funds in both panels (B) and (C) was similar. Their slightly greater growth on average per farm was found in the group of companies at risk, but even this group was internally more differentiated. The results in panels (B) and (C) were similar in the scope of asset cash yield as the share of circulating capital was similar. The differences concerned variables such as debt, sales and subsidies. Interestingly and what seems impossible was the fact that the farms which have higher sales and receive bigger subsidies constitute the panel of farms at risk. The reason for this situation was very high levels of debt, which translated into financial leverage. Knowing that they have the opportunity to gain greater support and better sales possibilities, the owners of these farms would put the farm in debt to take advantage of the opportunity to develop using, to a lesser extent, their own funds. Such activity is risky and may lead to a decrease or even total loss of financial security, but simultaneously may bring success in the shape of additional benefits stemming from the effect of financial leverage.

Table 5 presents the results of data panel estimation using the weighted least square

method for Polish farms (A), Polish farms not at risk (B), Polish farms at risk (C) and farms from developing countries from the EU (D).

Table 5. WLS estimation for the Δ cash variable in panel groups

Variable	Panel			
	Poland (A)	Central and Eastern UE (D)	unthreatened (B)	endangered (C)
Const	-0.564*** (-2.705)	1.549 (0.131)	-14.296*** (-13.95)	-42.209*** (-73.15)
<i>CF/TA</i>	3.847*** (114.781)	1.143** (2.016)	5.867*** (158.9)	6.867*** (136.0)
Subsidies	0.574*** (92.64)	2.094*** (2.678)	0.591*** (105.4)	0.446*** (80.73)
<i>S-T D</i>	-0.239*** (-24.659)	0.890*** (5.707)	0.824*** (55.36)	-0.07*** (-8.728)
<i>L-T D</i>	-0.032*** (-11.46)	0.766*** (3.254)	1.214*** (68.39)	
Sale	0.294*** (134.3)	-0.668** (-2.475)	0.198*** (141.5)	0.216*** (119.96)
<i>LIQ</i>		1.672* (1.675)	-0.400 (-1.441)	0.439*** (11.94)
<i>LEV</i>		-0.462** (-2.038)	-10.546*** (-66.52)	-0.651*** (-30.23)
Debt maturity				3.003*** (86.38)
R_2 (skor R_2)	0.719 (0.719)	0.912 (0.900)	0.977 (0.977)	0.948 (0.948)
Test F	20,761.41	74.35	37,373.88	42,029.0

significance level *** for $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: Source: own calculations based on the Polish database FADN as well as Eurostat, FADN Public Database (SO), <https://agridata.ec.europa.eu/extensions/FADNPublicDatabase/FADNPublicDatabase.html> (access: 15.10.2020).

The conducted panel WLS estimates for Poland show that *CF/TA*, subsidies and sales positively impact cash changes. All these factors are of a monetary character, which is the probable reason for such an impact. While short-term debt seems to be an obvious variable, what is surprising is the negative impact of long-term debt. From many years of team experience in research on agricultural farms in Poland, it seems that, on the whole, farmers in Poland unwillingly took advantage of external sources of funds. The negative coefficient indicates a decreasing amount of cash due to paying back long-term debt on a larger scale than becoming indebted. Analogical dependencies were observed by Farinh et al.³¹. In comparison with the WLS model for developing countries, there are visible differences in the case of variables such as short-term and long-term debt, sales, *LIQ* and *LEV*. For the model of developing countries, differences indicate a different impact of variables on cash changes. Positive coefficients, when in debt, indicate that the farm takes

³¹ J. Farinha, C. Mateus, N. Soares: Cash holdings and earnings quality: evidence from the Main and Alternative UK markets, *International Review of Financial Analysis* 56/2018, p. 248.

advantage of external sources of funds. This is in line with the well-known research findings of Pastor and Gama, among others. When examining Portuguese SMEs, they claimed that bigger companies were in greater long-term debt and more susceptible to bank loans while simultaneously having lower levels of cash resources, in accordance with the forecasts of the theory of compromise and pecking order³².

A negative coefficient of the sales variable shows that sales in developing countries took place with deferred payment dates. As a result, receivables became bigger but there was no positive change in cash. Chen et al.³³ obtained similar results. In the model for developing countries, there were additional variables, LIQ and LEV. The positive impact of the LIQ variable (a different dependency than in the research³⁴, which is impacted by the difference in the examined group of companies) indicates a lower share of working capital less liquid than cash in assets, which should enable the optimisation of cash level. It is possible to find justification for this situation in the approach of Keynes regarding motives for holding money. The coefficient of the LEV variable indicates an unfavourable relation of foreign capital to own capital as a result of an increase in debt. It is worth highlighting that the source of cash changes in developing countries is – to a greater degree than in Poland – subsidies (the coefficient of the subsidy variable is 4-fold higher for model D). These results confirm the research conducted by Amess et al.³⁵, who, citing Jensen (1986), argue that financial leverage decreases the amount of cash under the control of managers.

The division of farms in Poland into groups at risk and not at risk revealed a difference in the comparison of variables, significantly impacting cash changes and the direction as well as the force of impact. The variables with a force and direction of impact similar in both of the analysed groups are *CF/TA*, subsidies and sales. This is in line with the model results for the examined group of Polish farms. Differences connected with the direction of impact on the dependent variable emerged in the short-term debt variable case. Farms from the group at risk pay off their short-term debts by reducing cash. It is worth noting that long-term debt is strongly a factor, positively impacting cash changes in farms that are not at risk. The obtained results signify a financial gap in this group of farms, which should be assessed as a positive phenomenon (also, in the production of rice in Nigeria, it was stated that the existence of a financial gap and improved access to loans may have a positive impact on the efficiency of agricultural production³⁶. Confirmation of observations is a strong, negative impact on the dependent variable LEV in the group of

³² C.C. Pastor, P.M. Gama: Determinant Factors of Cash Holdings: Evidence from Portuguese SMEs, *International Journal of Business and Management*, 8, 1/2013, p. 104-112.

³³ H. Chen, D. Yang, J.H. Zhang, H. Zhou: Internal controls, risk management, and cash holdings, *Journal of Corporate Finance* 64/2020, 101695, <https://www.doi.org/10.1016/j.jcorpfin.2020.101695>

³⁴ P.J. García-Teruel, P. Martínez-Solano: On the Determinants of SME Cash Holdings: Evidence from Spain. *Journal of Business Finance & Accounting*, 35(1), (2)/2008, p. 127-149, <https://www.doi.org/10.1111/j.1468-5957.2007.02022.x>

³⁵ K. Amess, S. Banerji, A. Lampousis: Corporate cash holdings: Causes and consequences, *International Review of Financial Analysis*, 42/2015, p. 421-433.

³⁶ T.O. Ojo, A.A. Ogundejii, S.C. Babu, T. Alimi: Estimating financing gaps in rice production in Southwestern Nigeria. *Economic Structures*, 9, 12/2020, p. 7, <https://doi.org/10.1186/s40008-020-0190-y>

farms not at risk (similar results were obtained by Cai et al.³⁷, Chen et al.³⁸). In the group of farms at risk, there was another additional variable – debt maturity. This variable showed an additional impact on the dependent variable, which may be explained by the fact that farms at risk have a longer time to pay debts off (a bigger share of long-term debt, 70% on average – see Table 4), which means it has a smaller impact on cash changes.

Conclusions

The conducted research enables verification of the research hypotheses made. The first hypothesis, in which it was stated that “the cash holdings in Polish agriculture and developing countries of the EU is conditioned by budget support and sales”, was confirmed positively. In addition, it was found that the *CF/TA* has a positive impact on cash changes in Poland. The second research hypothesis states that loans are one of the determinants of funds and was also positively confirmed, though short-term and long-term liabilities negatively impact the dependent variable. Therefore, it was stated that, in Polish agriculture, a payback of liabilities did take place – which explains the negative impact on these variables.

A different situation was observed in the model of developing countries, in which positive coefficients for debt were found. They indicate that these farms make use of external sources of financing. It was also found that the coefficient of the LEV variable indicates an unfavourable relation of foreign capital to own capital due to debt increase. This happened as the sources of cash changes in developing countries are, to a greater extent than in Poland – subsidies.

Taking the research conducted into consideration, it can be stated that funds – and, more specifically, cash holdings – serve as opportunities for the implementation of the basic objectives of each and every enterprise: secure existence and development. Somewhat other determinants shaped funds in agriculture in Poland and developing countries. Generally, in both groups, it is possible to state that the basic factors for maintaining cash reserves are of a monetary nature, facilitating financial security.

Limitations

The conducted research revealed the necessity of continuing analyses in the context of post-pandemic financial security – especially since agriculture benefits from budget support and subsidies that constitute a key factor of cash holdings, and these reserves have decreased post-Brexit. In the future, it is necessary to focus on the direction and types of activity in agriculture conducive to ensuring the financial security of farmers and their families.

³⁷ W. Cai, Ch.C. Zeng, E. Lee, N. Ozkan, N.: Do business groups affect corporate cash holdings? Evidence from a transition economy, *China Journal of Accounting Research* 9/2016, p. 1-24.

³⁸ H. Chen, D. Yang, J.H. Zhang, H. Zhou: Internal controls, risk management, and cash holdings, *Journal of Corporate Finance* 64/2020, p. 101695. <https://www.doi.org/10.1016/j.jcorpfin.2020.101695>

References

- Al-Amarneh A.: Corporate cash holdings and financial crisis: evidence from Jordan, *International Business Research*, 8, 5/2015, p. 212-222.
- Al-Najjar B.: The Effect of Governance Mechanisms on Small and Medium-Sized Enterprise Cash Holdings: Evidence from the United Kingdom, *Journal of Small Business Management*, 53,(2)/2015, p. 303-320. <https://www.doi.org/10.1111/jsbm.12062>
- Amess K., Banerji S., Lampousis A.: Corporate cash holdings: Causes and consequences, *International Review of Financial Analysis*, 42/2015, p. 421-433. (2015). Corporate cash holdings: Causes and consequences. *International Review of Financial Analysis*, 42, p. 421-433.
- Angelovska M., Valentinčič A.: Determinants of Cash Holdings in Private Firms: The Case Of The Slovenian SMES, *Economic And Business Review*, 22, 1/2020, p. 5-36.
- Archiwalne kursy walut – tabela kursowa. Bankier.pl, <https://www.bankier.pl/narzedzia/archiwum-kursow-walutowych> (access: 24.11.2020).
- Bansal R., Bansal V.: A Research Paper on Determinants of Corporate Liquidity in India, *International Journal of Marketing and Technology*, 2, 4/2012, p. 103-117.
- Bereźnicka J.: (2018). Operational Subsidies and Financial Stability of Farms in the European Union, *Więś i Rolnictwo*, 3, (180)/2018, p. 113-135.
- Borkowski B., Dudek H., Szczesny W.: *Ekonometria. Wybrane zagadnienia*, Wydawnictwo Naukowe PWN, Warszawa 2003.
- Cai W., Zeng Ch.C., Lee E., Ozkan N.: Do business groups affect corporate cash holdings? Evidence from a transition economy, *China Journal of Accounting Research* 9/2016, p. 1-24.
- Chen H., Yang D., Zhang J.H., Zhou H.: Internal controls, risk management, and cash holdings, *Journal of Corporate Finance* 64/2020, 101695, <https://www.doi.org/10.1016/j.jcorpfin.2020>
- Chen N., Mahajan A.: Effects of Macroeconomic Conditions on Corporate Liquidity – International Evidence, *International Research Journal of Finance and Economics*, 35/2010, p. 112-129.
- Chen N., Yo S.: Government Deficits and Corporate Liquidity, *Asian Economic and Financial Review*, 2, 1/2012, p. 59-75.
- Dahiya S., Saunder A., Srinivasan A.: Financial distress and bank lending relationships, *Journal of Finance* 58/2003, p. 375-399.
- Farinha J., Mateus C., Soares N.: Cash holdings and earnings quality: evidence from the Main and Alternative UK markets, *International Review of Financial Analysis* 56/2018, p. 238-252.
- FADN Public Database (SO), <https://agridata.ec.europa.eu/extensions/FADNPublicDatabase/FADNPublicDatabase.html> (access: 15.10.2020).
- Franc-Dąbrowska J.: Crawling financialization in Central and Eastern Europe – on the example of Agriculture, *Economia Agro-Alimentare* 21, 3/2019, p. 1-19, <https://doi.org/10.3280/ECAG2019-0030062019>
- García-Teruel P.J., Martínez-Solano, P.: On the Determinants of SME Cash Holdings: Evidence from Spain, *Journal of Business Finance & Accounting*, 35 (1), (2)/2008, p. 127-149, <https://www.doi.org/10.1111/j.1468-5957.2007.02022.x>
- Global Risks 2013 Eight Edytion, Committed to Improving the State of The Word, World Economic Forum, Swizerland 2013
- Goodwin B.K., Mishra A.K.: Are decoupled farm program payment really decoupled? An empirical evaluation., *American Journal of Agricultural Economics*, 88/2006, p. 73-89.
- Guizani M.: The financial determinants of corporate cash holdings in an oil rich country: Evidence from Kingdom of Saudi Arabia., *Borsa Istanbul Review*, 17, 3/2007, p. 133-143.
- Isshaq Z., Bokpin G.A., Mensah Onymah J.: Corporate governance, ownership stucture, cash

- holdings, and firm value on the Ghana Stock Exchange, *Journal of Risk Finance*, 10, 5/ 2009, p. 488-499, <https://doi.org/10.1108/15265940911001394>
- Khanal A.R., Omobitan O.: Rural Finance, Capital Constrained Small Farms, and Financial Performance: Findings from a Primary Survey, *Journal of Agricultural and Applied Economics*, 52, 2/2020, p. 288-307. <https://doi.org/10.1017/aae.2019.45>
- Kropp J.D., Katchova A.L.: The effects of direct payments on liquidity and repayment capacity of beginning farmers., *Agricultural Finance Review*, 71/2001, 3, p. 347-365.
- Levitas E., McFadyen, M.A.: Managing liquidity in research-intensive firms: signaling and cash flow effects of patents and alliance activities., *Strategic Management Journal*, 30/2009, p. 659-678.
- Lian Y., Sepehri M., Foley M.: Corporate cash holdings and financial crisis: an empirical study of Chinese companies, *Eurasian Business Review*, 1, 2/2011, p. 112-124.
- Martínez-Sola C., García-Teruel P. J., Martínez-Solano P.: (2018). Cash holdings in SMEs: speed of adjustment, growth and financing., *Small Business Economics Journal*, 51 (4)/2018, p. 823-842. <https://www.doi.org/10.1007/s11187-018-9990-y>
- Ojo T.O., Ogundeji A.A., Babu S.C., Alimi T.: (2020). Estimating financing gaps in rice production in Southwestern Nigeria. *Economic Structures*, 9, 12/2020, p. 1-18. <https://doi.org/10.1186/s40008-020-0190-y>
- Ozkan A., Ozkan N.: Corporate cash holdings: an empirical investigation of UK companies. *Journal of Banking and Finance*, 28 (9)/2004, p. 2103-2134.
- Pastor C.C., Gama P.M.: Determinant Factors of Cash Holdings: Evidence from Portuguese SMEs. *International Journal of Business and Management*, 8, 1/2013, p. 104-112.
- Pawłowski M.: Modele dyskryminacyjne ocenie ryzyka wpadłości emitenta obligacji korporacyjnych. *Polityki Europejskie, Finanse i Marketing*, 19 (68)/2018, p. 211-222., <https://doi.org/10.22630/PEFIM/2018.19.68.18>
- Singh K., Misra M.: Financial determinants of cash holdings levels: An analysis of Indian agricultural enterprises. *Agricultural Economics – Czech*, 65 (5)/2019, p. 240-248.
- Trejo-Pech P.O, Gunderson M.A., Baker T.G., Gray A.W., Boehlje M.D.: Assessing Cash Holdings in Agribusiness. *International Food and Agribusiness Management Association*, 18, 4/2015, p. 85-105.
- Tursunov B.O.: Aspect of Financial Security of Industrial Enterprises Under Influence of Global Crisis, *Asian Journal of Technology & Management Research* 10, 01/2020, p. 116-122.

Źródła i determinanty rezerwy płynności w rolnictwie krajów Europy Środkowo-Wschodniej oraz z perspektywy bezpieczeństwa finansowego polskich gospodarstw rolnych

Streszczenie

Zapewnienie ciągłości działalności wymaga utrzymania płynności finansowej i określonego poziomu posiadania środków pieniężnych. Dotyczy to również gospodarstw, których właściciele pozyskują środki finansowe z różnych źródeł, w tym z kapitału obcego. Z tego względu celem opracowania była identyfikacja źródeł i określenie zasobów pieniężnych w gospodarstwach rolnych w krajach Europy Środkowo-Wschodniej. Dodatkowo, na podstawie szczegółowych danych z polskich gospodarstw, oceniono i porównano znaczenie zasobów pieniężnych w gospodarstwach charakteryzujących się wysokim poziomem bezpieczeństwa finansowego oraz tych, dla których identyfikujemy zagrożenie upadłością. Dane do badań pochodzą z bazy Farm Accounting Data Network (FADN) za lata 2013-

2018 (dla wszystkich rozpatrywanych przez nas krajów UE). W analizie dotyczącej zagrożenia upadłością w polskich gospodarstwach rolnych wykorzystaliśmy dane z FADN-PL za lata 2010-2018. W badaniu zastosowaliśmy metodę panelową – ważoną metodą najmniejszych kwadratów (WLS). Do obliczenia stanu posiadania środków pieniężnych zastosowaliśmy podejście dynamiczne. Wnioski z naszego badania wskazują, że wsparcie budżetowe dla rolników oraz wartość sprzedaży na gospodarstwo są głównymi źródłami i determinantami zasobów gotówki w gospodarstwach rolnych w krajach UE. Należy podkreślić, że wpływ wsparcia budżetowego na stan gotówki w polskich gospodarstwach był słabszy niż w innych badanych krajach. Ponadto stwierdzono, że istotnym czynnikiem wpływającym na stan posiadania gotówki był również poziom zadłużenia. W polskich gospodarstwach wpływ poziomu zadłużenia na stan posiadania gotówki był ujemny, a w innych krajach dodatni. Wartością dodaną pracy jest identyfikacja czynników, które wpływają na zmiany stanu posiadania gotówki, jest to więc dynamiczne podejście do posiadania gotówki.

Słowa kluczowe: rezerwa płynności, regresja panelowa, gospodarstwo, kraje UE

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THE SCALE OF CORPORATE BANKRUPTCIES DURING THE COVID-19 PANDEMIC

This article presents the impact of the COVID-19 pandemic on the scale of corporate bankruptcies in Poland. The study aims to determine the changes in the number of corporate bankruptcies during the COVID-19 pandemic according to the following criteria: type of procedure, type of activity, and province/region. The methods of analysis and processing of research results include descriptive and comparative analysis, as well as synthesis and deductive inference. The results indicate that the total number of corporate bankruptcies and restructuring proceedings has increased significantly during the COVID-19 pandemic. The research shows that in 2021, in comparison to the previous year, there were 65.8% more bankruptcy and restructuring proceedings, but most of them (82%) were carried out in the form of simplified restructuring procedures for approval of the arrangement introduced as part of the anti-crisis shield. The basis of the study was state public aid spent to support businesses in coping with the negative economic and social consequences triggered by the COVID-19 pandemic.

Keywords: corporate bankruptcy, COVID-19 pandemic, restructuring proceedings

JEL codes: G33, G34, G38

Introduction

Enterprises operate in an economy which is characterized by relatively high dynamics of changes, unpredictability, and uncertainty. The difficulty of predicting unexpected events in the company's environment generates risk for running a business, including the risk of bankruptcy of the company.

In the theory of Nassim Nicholas Taleb, the crisis was described as the "black swan in the order of events", a phenomenon that is very rare and difficult to predict. With this statement Nouriel Roubini argues, describing this as "white swan". According to him, crises are predictable and quite often recurring phenomena¹.

Recently, the spread of COVID-19 across the world, including Poland, introduced many restrictions limiting social and economic activity to inhibit the transmission of the SARS-CoV-2 virus. In Poland, on March 16, 2020, the first lockdown was introduced. This phenomenon had an impact on the economic activity of entities and the condition of the economy. As a result of a person's isolation, many economic systems stopped or significantly reduced activity, with future effects still to be noticed². Some companies have struggled to survive on the market in which it operates. It has also been noticed that some innovative businesses have been fast-growing and expanding the scope of activity (e.g.,

¹ N. Roubini N., S. Mihm: *Ekonomia kryzysu*, Oficyna a Wolters Kluwer Business, Warszawa 2011, p. 35.

² T. Aven, E. Zio: Globalization and global risk: How risk analysis needs to be enhanced to be effective in confronting current threats, *Reliability Engineering & System Safety*, 2021, p. 205, <https://doi.org/10.1016/j.res.2020.107270>

medical or information technology companies). On the contrary, some restaurants and food outlets went bankrupt.

It is worth emphasizing that the pandemic phenomenon was difficult to predict. Due to the globalization processes, such events may occur more frequently, making it necessary to estimate its risk. Thus, it is crucial to undertake research indicating areas of economic activity most sensitive to the occurrence of a pandemic and then provide the basis for shaping effective stimulus measures for business entities that allows mitigating the risk of corporate bankruptcy.

On March 18, 2020, the government introduced economic measures in response to the COVID-19 pandemic in Poland, and among these measures were also tax-related proposals. These measures comprise: economic stimulus measures (e.g., loans, moratorium on debt repayments), employment-related measures (e.g., state compensation schemes, training), customs measures (e.g., duty relief), and an ‘Anti-Crisis’ shield for the tourism industry to support for businesses affected by COVID-19³. Considering that these measures were crucial to business survival, this requires more in-depth research. The limited space contained within this article means that this issue deserves to be developed in further studies.

It is worth mentioning that granting public aid to rescue or restructure entrepreneurs is commonly referred to as the ‘New Chance Policy’. This aid was provided in the form of the following programs: rescue aid, temporary restructuring support (for no longer than 18 months), and aid for restructuring that may be granted in various forms (i.e., loans; taking up stocks or shares in the increased share capital or participation in increasing the share capital by increasing the nominal value of the existing shares or stocks; taking up bonds; changes in deadlines for loan repayment to the entity granting the restructuring aid; the conversion of a loan, etc.). PLN 120 million (from the state budget) will be allocated for support under the New Chance Policy for ten years⁴.

Following the introduction, the next section of the article presents the methodology. Then, this study shows findings. Finally, the article formulates conclusions which stress the added value of the approach.

Materials and methodology of research

The study aims to determine the changes in the number of corporate bankruptcies at the time of the COVID-19 pandemic according to the following criteria: type of procedure, type of activity, and province/region. The timeframe of the research covers 2020-2022 and 2018-2019 (for comparisons). The methods of analysis and processing of results include:

- descriptive and comparative analysis;
- synthesis.

The first part of the study presents a literature overview. The author concentrates on the terms related to corporate bankruptcy and restructuring procedures. Additionally, the article points out determinants of bankruptcy and anti-crisis shield as public aid and bankruptcy prevention tools during the COVID-19 pandemic.

³Poland. Government and institution measures in response to COVID-19, KPMG, 2020, <https://home.kpmg/xx/en/home/insights/2020/04/poland-government-and-institution-measures-in-response-to-covid.html> (access: 28.11.2022).

⁴ Ibidem.

In the empirical section, it is examined whether the crisis caused by the COVID-19 pandemic contributed to an increase in the number of bankruptcies of enterprises in Poland, also classified by province/region and type of activity.

The author's own analyses and calculations were made based on data from Centralny Ośrodek Informacji Gospodarczej (COIG) and the applicable laws on the insolvency of enterprises in Poland.

The obtained results are presented using the methods of deductive inference in a descriptive, tabular, and graphic form.

Literature overview

The existing literature discusses the consequences of the COVID-19 pandemic from economic, financial, and social perspectives. The global epidemic crisis triggered by the spread of the SARS-CoV-2 virus affected the emergence and intensification of the recession, as well as economic depression in the long term. As a result of these crisis phenomena, financial problems occurred in the economy, and consequently, the bankruptcies of enterprises and liquidation of job places. It is worth mentioning that it will be time-consuming and expensive to rebuild global supply chains that have been broken.

Bartik et al. conducted a survey on 5,800 small businesses in the US between March 28 and April 4, 2020. Their findings demonstrate the financial fragility of many small businesses. They present that 43% of businesses were temporarily closed and that the level of employment had reduced by 39%. These results indicate that many of these companies had little cash available at the beginning of the pandemic. They either had to cut expenses, take on additional debt, or declare liquidation. This means that financial support is crucial to prevent business failures⁵.

Janzen and Radulescu⁶ collected a data sample consisting of circa 10,000 firms from 23 Southern and Eastern European countries. Janzen and Radulescu "(...) reveal that reported year-on-year sales growth decreases on average by 0.63 percentage points for each one-point increase in lockdown stringency, as measured by the Oxford COVID-19 Government Response Tracker (...)". Janzen and Radulescu claim that "(...) firm size and sectoral affiliation are related to firm performance in times of pandemic crisis (...)"⁷.

The terms 'bankruptcy' and 'insolvency' are frequently treated as synonyms. It is not precise because bankruptcy is the notion of economics, first and foremost, while insolvency is a legal category⁸.

From the viewpoint of economics, a bankrupt company is one which is not able to pay its debts, and the value of assets is not sufficient to cover total liabilities (a bankrupt company is also one which, in spite of the above-mentioned determinants, is still able to

⁵ A.W. Bartik, M. Bertrand, Z. Cullen, Edward L. Glaeser, M. Luca, Ch. Stanton: The impact of COVID-19 on small business outcomes and expectations, PNAS, 117 (30)/2020, p. 17656-17666, <https://doi.org/10.1073/pnas.2006991117>

⁶ B. Janzen, D. Radulescu: Effects of COVID-19 related government response stringency and support policies: Evidence from European firms, *Economic Analysis and Policy*, 76/2022, p. 130.

⁷ Ibidem.

⁸ E. Mączyńska: Ocena ryzyka upadłości przedsiębiorstwa. [in:] A. Fierla (ed.), *Ryzyko w działalności przedsiębiorstw. Wybrane aspekty*, Oficyna Wydawnicza Szkoły Głównej Handlowej w Warszawie, Warszawa 2009, p. 57.

stay on the market). In economic terms, bankruptcy does not have to mean insolvency in legal terms, but each insolvency declared by the court means economic bankruptcy.

Corporate bankruptcy relates to its financial standing and occurs when a company cannot continue its activity without external support⁹. Maślanka¹⁰ argues that problems with solvency may result from insufficient financial liquidity, which results in bankruptcy. Sierpińska maintains that the main symptom of bankruptcy is the loss of the ability to repay the contracted liabilities, which confirms that economic bankruptcy is closely related to the lack of financial liquidity of an economic entity in the long term¹¹.

The literature develops several methods whose purpose was to explain the probability of corporate bankruptcy. The bankruptcy research includes two main areas: corporate bankruptcy prediction and the theoretical and empirical investigations of the process leading to business failures. Prusak presents “(...) the review and assessment of the level of advancement of bankruptcy prediction research in countries of the former Eastern Bloc, in comparison to the latest global research trends in this area (...)”¹².

Tomczak and Staszkiwicz consider that “(...) the estimated model based on one economy is not necessarily applicable to other economies (...)”¹³. This supports the need for new implementation methods such as, for example, fsQCA, that could be adjusted to evaluate the risk of corporate bankruptcy during the COVID-19 outbreak.

It is worth stressing that despite a significant number of publications, the findings of Bellovary et al. are still valid namely, existing models are poorly used in practice¹⁴.

Most frequently, bankruptcy precedes crisis, which is the result of the impact of adverse internal and external macroeconomic factors. The phase of the economic cycle is the most influential macroeconomic factor. An unfavorable economic situation increases an adverse selection of ineffective entities, contributing to the change of resource allocation.

In many countries, there is a close correlation between the business cycle and bankruptcy figures. The approaches followed in many studies are usually partial as they only focus on one-way interactions between bankruptcies and the business cycle¹⁵. Bruneau, de Bandt, and El Amri attempt to combine two strands of the quantitative economic literature and considered evidence that indicates two-way interactions between corporate bankruptcies and the macroeconomy¹⁶.

⁹ B. Prusak: *Ekonomiczna analiza upadłości przedsiębiorstw – ujęcie międzynarodowe*, Wydawnictwa Fachowe CeDeWu.pl, Warszawa 2011, p. 180-183.

¹⁰ T. Maślanka: *Przepływy pieniężne w zarządzaniu finansami przedsiębiorstw*, Wydawnictwo C.H. Beck, Warszawa 2008, p. 23.

¹¹ M. Sierpińska, T. Jachna: *Ocena przedsiębiorstwa według standardów światowych*, Wydawnictwo Naukowe PWN, Warszawa 2007, p. 112.

¹² B. Prusak: *Review of Research into Enterprise Bankruptcy Prediction in Selected Central and Eastern European Countries*, *International Journal of Financial Studies*, 6, 60/2018, p. 1, <https://doi.org/10.3390/ijfs6030060>

¹³ S.K. Tomczak, P. Staszkiwicz: *Cross-Country Application of Manufacturing Failure Models*, *Journal of Risk and Financial Management*, 13, 34/2020, p. 1, <https://doi.org/10.3390/jrfm13020034>

¹⁴ J.L. Bellovary, D.E., Giacomino, M.D. Akers: *A review of bankruptcy prediction studies: 1930 to present*, *Journal of Financial Education*, 33/2007, p. 1-42.

¹⁵ C. Bruneau, O. de Bandt, W. El Amri: *Macroeconomic fluctuations and corporate financial fragility*, *Journal of Financial Stability*, 8/2012, p. 220. <http://dx.doi.org/10.1016/j.jfs.2012.02.002>

¹⁶ *Ibidem*, p. 229-230.

Results

Economic and social systems are threatened by cascading outbreaks, whose impacts can achieve vast scales through their interdependencies, as shown by the COVID-19 pandemic. The research states that the scale of economic and social problems is significant because the pandemic has been affecting the monetary sphere and the real economy. Moreover, it seems that, so far, we have never been exposed to such a high risk in an economy and business activity.

The COVID-19 pandemic has also caused a massive increase in uncertainty, comparable to that of the global financial crisis of 2008-2009¹⁷.

The impact of COVID-19 on sectors of the economy differs significantly¹⁸. The travel industry, airlines, and tourism destinations have been deeply affected. Existing studies on COVID-19 effects on economies allow us to indicate which sectors are mostly affected by the pandemic (e.g., the food and beverage sector¹⁹, UK food retailers and the restaurant sector²⁰, and the water sector in Europe²¹).

A PwC report indicates that over 90% of companies in Poland experienced problems in functioning after the outbreak of the COVID-19 pandemic, 63% of medium-sized manufacturing companies limited the scale of business activity in 2020, more than 20% of industrial enterprises decided to reduce the number of employees and one-third of companies reported lower revenues and cash flow problems²².

Between 2018 and 2021, 2,200 corporate bankruptcy declarations were issued in Poland. Figure 1 indicates that the largest number of them – 615 – was recorded in 2018. The year 2021 shows a significant (29.8%) decrease in this phenomenon compared to the previous year. This fact may seem unexpected given the COVID-19 pandemic that has been ongoing since March 2020, which has contributed to illiquidity for many companies. However, it should be noted that on June 19, 2020 – as part of the so-called “Anti-Crisis Shield 4.0.” – the act entered into force, which by November 30, 2021, introduced a new type of restructuring procedure in the form of a simplified procedure for approval of an arrangement²³. Analyzing the data presented in Figure 1, the introduction of a new type of procedure resulted in an increase in the number of restructuring proceedings by 72% in 2020 compared to 2019, and a growth of 136% in 2021 compared to 2020.

¹⁷ K. Czech, A. Karpio, M. Wielechowski, T. Woźniakowski, D. Żebrowska-Suchodolska: Polska gospodarka w początkowym okresie pandemii COVID-19, Wydawnictwo SGGW, Warszawa 2020, p. 123.

¹⁸ I. Szczepaniak, Ł. Ambroziak, J. Drożdż: Wpływ pandemii COVID-19 na przetwórstwo spożywcze i eksport rolno-spożywczy Polski, Ubezpieczenia w Rolnictwie – Materiały i Studia, 1 (73)/2020, p. 141.

¹⁹ T. Bucak, S. Yiğit: The future of the chef occupation and the food and beverage sector after the COVID-19 outbreak: Opinions of Turkish chefs, International Journal of Hospitality Management, 92/2021, p.1, <https://doi.org/10.1016/j.ijhm.2020.102682>

²⁰ L.A. Panzone, S. Larcom, P.W. She, P.W.: Estimating the impact of the first COVID-19 lockdown on UK food retailers and the restaurant sector, Global Food Security, 28/2021, p. 1, <https://doi.org/10.1016/j.gfs.2021.100495>

²¹ S.H. Antwi, D. Getty, S. Linnane, A. Rolston: COVID-19 water sector responses in Europe: A scoping review of preliminary governmental interventions, Science of The Total Environment, 762/2020, p. 2, <https://doi.org/10.1016/j.scitotenv.2020.143068>

²² Raport Polski mikro, mały i średni biznes w obliczu pandemii COVID-19. Przychody, płynność i reakcja na wstrząs, PwC, 2020, <https://www.pwc.pl/pl/pdf/polski-mikro-maly-sredni-biznes-w-obliczu-pandemii.pdf>, p. 2 (access: 30.08.2022).

²³ Ustawa z 16 kwietnia 2020 r. o szczególnych instrumentach wsparcia w związku z rozprzestrzenianiem się wirusa SARS-CoV-2, Dz.U. z 2020, poz. 695.

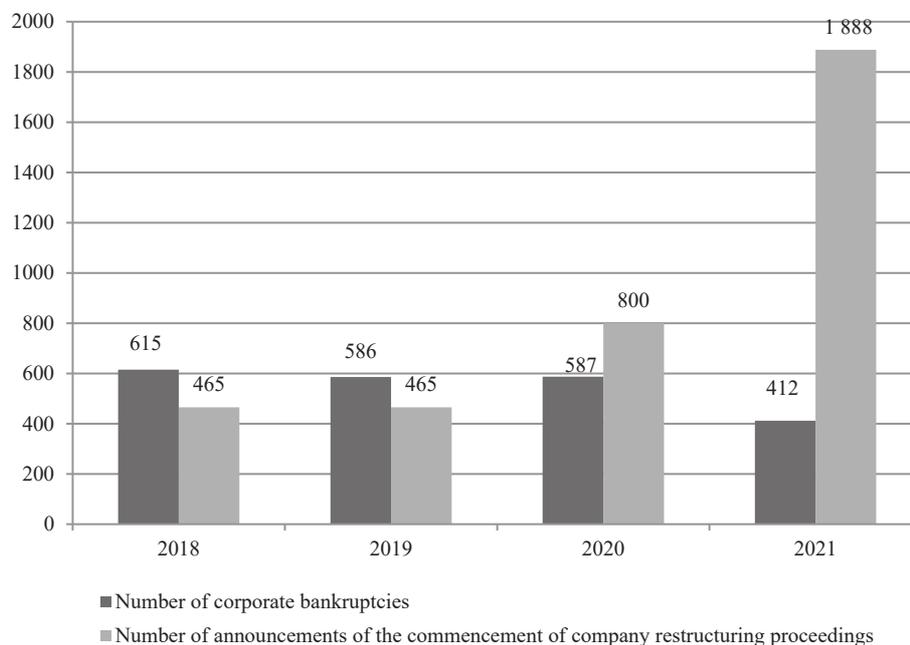


Figure 1. Number of corporate bankruptcies and announcements of the commencement of company restructuring proceedings in Poland in 2018-2021

Source: Author's own elaboration based on COIG data, from: Upadłości firm w 2021 r., COIG, https://www.coig.com.pl/files/pliki/Raporty/coig_upadloscifirm_2021_listopad.pdf (access: 15.09.2022); Upadłości firm w 2020 r., COIG, https://www.coig.com.pl/files/pliki/Raporty/coig_upadloscifirm_2020pazdziernik.pdf (access: 15.09.2022); Upadłości firm w 2019 r., COIG, https://www.coig.com.pl/files/pliki/Raporty/coig_upadloscifirm_2019czerwiec.pdf (access: 15.09.2022); Upadłości firm w 2018 r., COIG, https://www.coig.com.pl/files/pliki/Raporty/coig_upadloscifirm_2018wrzesien.pdf (access: 15.09.2022).

The possibility of carrying out a simplified restructuring procedure expired on November 30, 2021. However, the importance of this procedure meant that from December 1, 2021, provisions amending the restructuring law were introduced, which permanently regulated the possibility of using a similar simplified restructuring procedure²⁴.

The analysis of the bankruptcy structure of companies in sectoral cross-sections allows identifying branches of the economy that are burdened with a relatively high risk of activity and designing support tools for specific industries. In 2020 and 2021, as in the previous years, the largest group of companies declaring bankruptcy were entities operating in the following sectors: trade, manufacturing and construction (Figure 2).

²⁴ Raport roczny Coface: Niewypłacalności firm w Polsce w 2021 roku, <https://www.coface.pl/Aktualnosci-i-media/Biuro-prasowe/Raport-roczny-Coface-Niewypłacalnosci-firm-w-Polsce-w-2021-r.>, p. 4 (access: 01.09.2022).

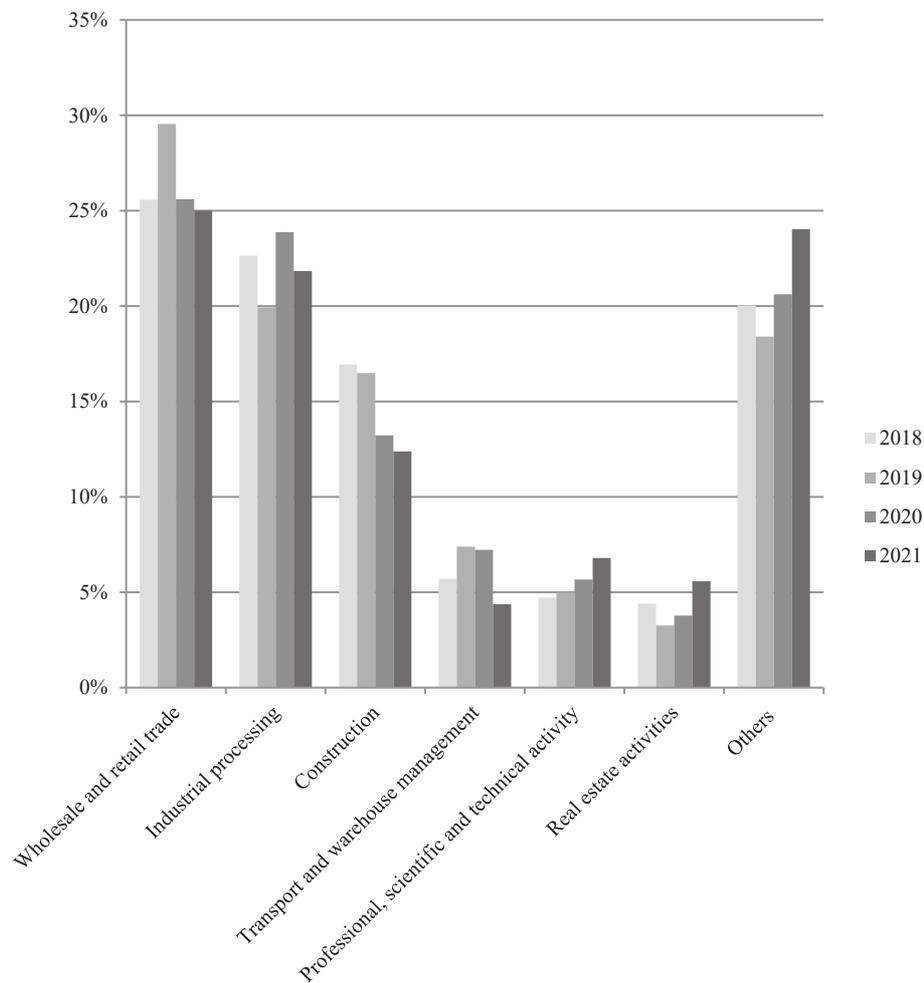


Figure 2. Corporate bankruptcies by industry in 2018-2021 in Poland

Source: Author's own elaboration based on COIG data from Upadłości firm w 2021 r., COIG, https://www.coig.com.pl/files/pliki/Raporty/coig_upadlosci_firm_2021listopad.pdf (accessed: 15.09.2022); Upadłości firm w 2020 r., COIG (accessed: 15.09.2022); Upadłości firm na koniec czerwca 2019 r., (accessed: 15.09.2022); Upadłości firm w 2018 r., https://www.coig.com.pl/files/pliki/Raporty/coig_upadlosci_firm_2018wrzesien.pdf (accessed: 15.09.2022).

Considering the 2018-2021 period, the largest number of bankruptcy proceedings for enterprises was recorded in the Masovian Voivodeship (province/region). In 2021, there were 114 of them in this region, which accounted for 29.6% of the total bankruptcies announced in Poland during that period (Figure 3). The second position goes to the Silesian province; but, in 2021, the number of bankruptcy proceedings in this area dropped to 33

(from 72 the previous) year, and next is the Wielkopolskie Voivodeship. The lowest number of corporate bankruptcies was announced in the Podlaskie, Opolskie and Świętokrzyskie Voivodeships, with the latter falling from 14 companies in 2020 to just 1 in 2021 (Figure 3).

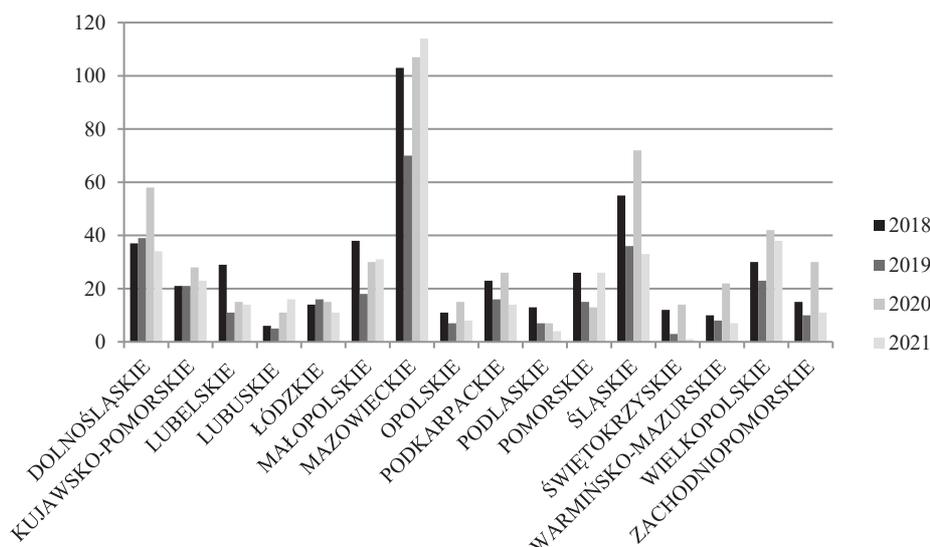


Figure 3. Number of corporate bankruptcies by voivodeships in Poland in 2018-2021

Source: Author's own elaboration based on COIG data, from: Upadłości firm w 2021 r., COIG, https://www.coig.com.pl/files/pliki/Raporty/coig_upadloscifirm_2021_listopad.pdf (access: 15.09.2022); Upadłości firm w 2020 r., COIG, https://www.coig.com.pl/files/pliki/Raporty/coig_upadloscifirm_2020_pazdziernik.pdf (access: 15.09.2022); Upadłości firm w 2019 r., COIG, https://www.coig.com.pl/files/pliki/Raporty/coig_upadloscifirm_2019_czerwiec.pdf (access: 15.09.2022); Upadłości firm w 2018 r., COIG, https://www.coig.com.pl/files/pliki/Raporty/coig_upadloscifirm_2018_wrzesien.pdf (access: 15.09.2022).

The negative consequences of the COVID-19 pandemic that has affected economies in various countries highlight the essential role of anti-crisis policy responses. Proper anti-crisis measures response would reduce and mitigate the negative effects of the COVID-19 pandemic and the loss of economic resources. According to Bernanke and Gertler²⁵, the policy analysis indicates that, under some conditions, government bailouts of insolvent debtors may be a reasonable alternative in times of enormous financial fragility. Janzen and Radulescu point out that extensive state funding has been expended to support businesses to overcome the negative economic consequences triggered by the pandemic²⁶. State aid in the face of the crisis is one tool that allows entrepreneurs conducting business activity to protect the company against bankruptcy caused by the loss of financial liquidity.

²⁵ B. Bernanke, M. Gertler: Financial fragility and economic performance, Social Systems Research Institute, SSRI Workshop Series, 8705/1987, p. 36-37.

²⁶ B. Janzen, D. Radulescu: Effects of COVID-19..., 2022, *op. cit.*, p. 129.

In Poland, 348,000 micro-, small- and medium-sized enterprises benefited from the Financial Shield Program and received partially non-returnable or totally non-returnable state public aid for a total amount of nearly PLN 61 billion. It was a package of a series of solutions that was supposed to mitigate the pandemic's negative effects and the crisis's emergence. The Anti-Crisis Shield included actions in the following areas: healthcare, job protection, strengthening the financial system, public investments, and corporate financing.

Entrepreneurs who met the conditions imposed by the government (e.g., continuing business activity and maintaining the level of employment) were not obliged to repay one-off loans or had to repay only a small part of them. A study by Dębkowska et al. by the Polish Economic Institute shows that 86% of Polish enterprises took advantage of public aid, and 92% benefited from more than one area of assistance²⁷.

Conclusions

Based on the research, the following conclusions were drawn:

1. The total number of bankruptcy and restructuring proceedings during the COVID-19 pandemic increased in Poland. However, it should be noted that the introduction of a new simplified form of restructuring under the anti-crisis shield significantly impacted this increase. The simplified restructuring proceedings were used by entities that were insolvent due to the crisis caused by the COVID-19 pandemic.

2. The study shows the increased activity of the state, which in Poland – through the implementation of anti-crisis shield programs – impacted the situation of enterprises and stabilized the market during the COVID-19 pandemic. The aid measures stopped the increase of companies declaring bankruptcy in court to liquidate assets for taking advantage of their restructuring. The number of restructuring proceedings increased dramatically in 2021 in comparison to 2020.

3. In the analyzed period, most corporate bankruptcies took place in the Masovian Voivodeship. The scale of bankruptcy in individual regions should be analyzed taking into account their economic potential. The research assumed that if a higher level of development characterizes a given Voivodeship, it has large economic potential as well as the number of registered business entities; thus, the number of bankruptcies will also be large there.

4. The results of the conducted analyses can be used in shaping the sector policy regarding mainly the state's role in creating and monitoring tools for corporate bankruptcy scale reduction and preventing them, as well as offering various forms of assistance to entities undergoing restructuring processes. The analysis may be used by business owners, managers, representatives of banks and financial institutions, representatives of government, and self-government administration. Especially at the local level, this is important to create programs/funds supporting the so-called "victims" of bankruptcy processes caused by the consequences of the COVID-19 pandemic.

²⁷ K. Dębkowska, U. Kłosiewicz-Górecka, A. Szymańska, P. Ważniewski, K. Zybortowicz: Tarcza Antykryzysowa. Koło ratunkowe dla firm i gospodarki?, Polski Instytut Ekonomiczny, Warszawa 2021, p. 5-6, https://pie.net.pl/wp-content/uploads/2021/09/PIE-Raport_Tarcze-antykryzysowe.pdf (access: 01.09.2022).

References

- Antwi S.H., Getty D., Linnane S., Rolston A.: COVID-19 water sector responses in Europe: A scoping review of preliminary governmental interventions, *Science of The Total Environment*, 762/2020, <https://doi.org/10.1016/j.scitotenv.2020.143068>
- Aven T., Zio E.: Globalization and global risk: How risk analysis needs to be enhanced to be effective in confronting current threats, *Reliability Engineering & System Safety*, 205/2021, <https://doi.org/10.1016/j.res.2020.107270>
- Bartik A.W., Bertrand M., Cullen Z., Glaeser E.L., Luca M., Stanton Ch.: The impact of COVID-19 on small business outcomes and expectations, *PNAS*, 117 (30)/2020, p. 17656-17666, <https://doi.org/10.1073/pnas.2006991117>
- Bellovary J.L., Giacomino D.E., Akers M.D.: A review of bankruptcy prediction studies: 1930 to present, *Journal of Financial Education*, 33/2007, p. 1-42.
- Bernanke B., Gertler M.: Financial fragility and economic performance, *Social Systems Research Institute, SSRI Workshop Series*, 8705/1987, p. 36-37.
- Bruneau C., de Bandt O., El Amri W.: Macroeconomic fluctuations and corporate financial fragility, *Journal of Financial Stability*, 8/2012, p. 220. <http://dx.doi.org/10.1016/j.jfs.2012.02.002>
- Bucak T., Yiğit S.: The future of the chef occupation and the food and beverage sector after the COVID-19 outbreak: Opinions of Turkish chefs, *International Journal of Hospitality Management*, 92/2021, <https://doi.org/10.1016/j.ijhm.2020.102682>
- Czech K., Karpio A., Wielechowski M., Woźniakowski T., Żebrowska-Suchodolska D.: Polska gospodarka w początkowym okresie pandemii COVID-19, *Wydawnictwo SGGW, Warszawa 2020*.
- Dębkowska K., Kłosiewicz-Górecka U., Szymańska A., Ważniewski P., Zybortowicz K.: Tarcza Antykryzysowa. Koło ratunkowe dla firm i gospodarki?, *Polski Instytut Ekonomiczny, Warszawa 2021*, p. 5-6, https://pie.net.pl/wp-content/uploads/2021/09/PIE-Raport_Tarcze-antykryzysowe.pdf (access: 01.09.2022).
- Janzen B., Radulescu D.: Effects of COVID-19 related government response stringency and support policies: Evidence from European firms, *Economic Analysis and Policy*, 76/2022, p. 129-145.
- Mączyńska E.: Ocena ryzyka upadłości przedsiębiorstwa, [in:] A. Fierla (ed.), *Ryzyko w działalności przedsiębiorstw. Wybrane aspekty*, Oficyna Wydawnicza Szkoły Głównej Handlowej w Warszawie, Warszawa 2009, p. 57-76.
- Maślanka T.: *Przepływy pieniężne w zarządzaniu finansami przedsiębiorstw*, Wydawnictwo C.H. Beck, Warszawa 2008.
- Panzone L. A., Larcom S., & She P. W.: Estimating the impact of the first COVID-19 lockdown on UK food retailers and the restaurant sector, *Global Food Security*, 28/2021, p. 1-11, <https://doi.org/10.1016/j.gfs.2021.100495>
- Poland. Government and institution measures in response to COVID-19, *KPMG*, 2020, <https://home.kpmg/xx/en/home/insights/2020/04/poland-government-and-institution-measures-in-response-to-covid.html> (access: 28.11.2022).
- Prusak B.: *Ekonomiczna analiza upadłości przedsiębiorstw – ujęcie międzynarodowe*, Wydawnictwa Fachowe CeDeWu.pl, Warszawa 2011.
- Prusak B.: Review of Research into Enterprise Bankruptcy Prediction in Selected Central and Eastern European Countries, *International Journal of Financial Studies*, 6, 60/2018, p. 1-28, <https://doi.org/10.3390/ijfs6030060>
- Raport Polski mikro, mały i średni biznes w obliczu pandemii COVID-19. Przychody, płynność

- i reakcja na wstrząs, PwC, 2020, <https://www.pwc.pl/pl/pdf/polski-mikro-maly-sredni-biznes-w-obliczu-pandemii.pdf>, p. 1-23 (accessed: 30.08.2022).
- Raport roczny Coface: Niewypłacalności firm w Polsce w 2021 roku, <https://www.coface.pl/Aktualnosci-i-media/Biuro-prasowe/Raport-roczny-Coface-Niewypłacalnosci-firm-w-Polsce-w-2021-r.>, p. 1-13 (access: 01.09.2022).
- Roubini N., Mihm S.: *Ekonomia kryzysu*, Oficyna Wolters Kluwer Business, Warszawa 2011.
- Sierpińska M., Jachna T.: *Ocena przedsiębiorstwa według standardów światowych*, Wydawnictwo Naukowe PWN, Warszawa 2007.
- Szczepaniak I., Ambroziak Ł., Drożdż J.: Wpływ pandemii COVID-19 na przetwórstwo spożywcze i eksport rolno-spożywczy Polski, *Ubezpieczenia w Rolnictwie – Materiały i Studia*, 1 (73)/2020, p. 141-163.
- Tomczak S.K., P. Staszkiwicz: Cross-Country Application of Manufacturing Failure Models, *Journal of Risk and Financial Management*, 13, 34/2020, p. 1-10, <https://doi.org/10.3390/jrfm13020034>
- Upadłości firm w 2018 r., COIG, https://www.coig.com.pl/files/pliki/Raporty/coig_upadlosci_firm_2018wrzesien.pdf (access: 15.09.2022).
- Upadłości firm w 2019 r., COIG, https://www.coig.com.pl/files/pliki/Raporty/coig_upadlosci_firm_2019czerwiec.pdf (access: 15.09.2022).
- Upadłości firm w 2020 r. , COIG, https://www.coig.com.pl/files/pliki/Raporty/coig_upadlosci_firm_2020pazdziernik.pdf (access: 15.09.2022).
- Upadłości firm w 2021 r., COIG, https://www.coig.com.pl/files/pliki/Raporty/coig_upadlosci_firm_2021listopad.pdf (access: 15.09.2022).
- Ustawa z 16 kwietnia 2020 r. o szczególnych instrumentach wsparcia w związku z rozprzestrzenianiem się wirusa SARS-CoV-2, Dz.U. 2020, poz. 695.

Skala bankructw przedsiębiorstw w okresie pandemii COVID-19

Streszczenie

W artykule omówiono oddziaływanie pandemii COVID-19 na skalę bankructw przedsiębiorstw w Polsce. Celem opracowania było określenie zmian liczby bankructw przedsiębiorstw w okresie pandemii COVID-19 według następujących kryteriów podziału: rodzaj postępowania, rodzaj działalności, województwa. Wykorzystano następujące metody badawcze: analizę opisową i porównawczą, syntezę i wnioskowanie dedukcyjne. Ustalono, że łączna liczba bankructw przedsiębiorstw oraz postępowań restrukturyzacyjnych znacznie wzrosła w okresie pandemii COVID-19. W 2021 roku, w porównaniu do roku poprzedniego, miało miejsce o 65,8% więcej postępowań upadłościowych i restrukturyzacyjnych, a większość z nich (82%) przeprowadzono w formie uproszczonego postępowania restrukturyzacyjnego o zatwierdzenie układu, wprowadzonego w ramach tarczy antykryzysowej. Stwierdzono, że pomoc publiczna została przeznaczona na wsparcie przedsiębiorstw w zakresie przeciwdziałania negatywnym ekonomicznym i społecznym konsekwencjom pandemii COVID-19.

Słowa kluczowe: bankructwo przedsiębiorstw, pandemia Covid-19, postępowanie restrukturyzacyjne

Kody JEL: G33, G34, G38

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TAX JURISDICTION OF COMMUNES IN POLAND AND METHODS OF ITS IMPLEMENTATION

The aim of the study was to determine the possibility of using methods of implementing the tax governance of municipalities in the field of local taxes and to assess the importance of using government for the financial planning of the municipality in the conditions of the financial crisis. In order to achieve the goal, 60 randomly selected communes of various types were analyzed. The following methods were used: literature analysis, analysis of local legal acts, in-depth interviews, and statistical studies. Data for the years 2019-2021 was used for the analysis. On the basis of the analyzed material, it was found that there is a diversified scope of using the methods of tax governance in communes. Tax jurisdiction is an important factor influencing the financial policy of communes in the opinion of the respondents, but the use of these methods in practice in the analyzed period was very limited. The analyses show that the communes perceive the risk of legal and financial changes, and most do not use the methods of exercising power due to limited income and an increase in expenses related to the crisis after the pandemic.

Keywords: local taxes, tax authority, community

JEL codes: H2, H3

Introduction

Local self-government participates in the exercise of public authority. It performs public tasks assigned to itself under statutes on its own behalf and under its own responsibility¹. It is a representative form of organization of civil society, as well as local and regional authorities with a democratic character, in a given territory. Local government is legally established to perform certain types of tasks. The local government system works on the basis of dualism, which means that the government administration, and the rest by local governments carry out some tasks.

Local self-government creates, by operation of law, a local society which is managed directly or by means of bodies selected by it, and carries out tasks in the field of public administration delegated by the legislator². The independence of action largely depends on the scope and type of powers entrusted to local governments by the state. Thus, self-government independence means that it carries out selected tasks independently and

¹ K. Chochowski: Zadania samorządu gminnego w Polsce w sferze bezpieczeństwa i porządku publicznego, [in:] M. Stec, S. Płażek (eds), Charakter i konstrukcja zadań samorządu terytorialnego, Wolters Kluwer, Warszawa 2017, p. 113.

² Ł. Satoła, A. Standar, A. Kozera: Financial Autonomy of Local Government Units: Evidence from Polish Rural Municipalities, Lex Localis-Journal, Of Local Self-Government, 17, 2/2019, p. 321-342.

independently of the will of other entities. Local self-government is characterized by independence and self-reliance³.

Independence covers all spheres of its activity. Units of local self-government have the right to decide, within the limits of statutes, about their internal system and have the right to create their own Administrative organs. They are equipped with their own assets and also have a constitutionally guaranteed share in public revenues. Independence is an essential and fundamental feature of self-governance⁴. The basis of self-government is legal subjectivity separate from the state. Local government bodies cannot be equated with government administration bodies because they are not hierarchically subordinate to them; they are only subject to supervision carried out according to the legality criterion.

The tasks of the commune are carried out with the help of the possessed financial means. They come from three sources: their own income, external transfers, and loans and credits. This means that municipalities run financial management with an income of a diversified nature. The catalog of incomes and the rules for their determination and accumulation are included in the Act on the Income of Local Government Units⁵. The act stipulates that the revenues of local government units are their own revenues, general subsidy, and specific subsidies. Income also constitutes a share in the receipts from personal income tax and corporate income tax. In addition, these may be non-returnable funds from foreign sources, funds from the European Union budget, as well as other funds specified in separate regulations. The main and the most stable source of financing for implementing the commune's tasks is its own income. It is [to them] the commune that has the statutory right to obtain them while using other sources at the same time.

The sources of income at the disposal of municipalities largely determine their independence in terms of income. It is about the ability to run and implement your own commune's fiscal policy⁶. This is due to the granted tax authority, thanks to which the commune is able to shape the structure of local taxes and fees in its territory. In this respect, this function is reduced to the role of the tax authority. They include all tax benefits that constitute the income of the commune's budget and may be shaped to some extent by the commune council⁷. The authorities' actions must comply with the relevant regulations, strategic and planning documents (at the national, regional and local level), and with the principle of sustainable development and spatial order.

In addition, they must be run socially and economically efficiently. This requires rational fiscal policy within limited revenues. The commune is the basic unit of local self-

³ J. Hałat-Majka: Władza stanowiąca a zrównoważony rozwój samorządu terytorialnego, [in:] S. Stachera Włodarczyk, S. Cichoń (eds), *Zrównoważony rozwój w zarządzaniu*, Wydawnictwo Wydziału Zarządzania Politechniki Częstochowskiej, Częstochowa 2018, p. 22.

⁴ M. Mączyński: *Reforma ustroju samorządu terytorialnego: uwarunkowania, możliwości i konsekwencje zwiększenia samodzielności JST, MSAP*, Kraków 2014, p. 10.

⁵ Ustawa z dnia 13 listopada 2003 o dochodach jednostek samorządu terytorialnego, Dz.U. z 2021 r. poz. 1672 as amend.

⁶ T. Wołowicz: *Konkurencyjność podatkowa gminy w kontekście posiadania lokalnej strategii podatkowej*, *Samorząd Terytorialny* 7-8/2020, p. 151.

⁷ L. Eteł, R. Dowgier, G. Liszewski, B. Pahl: *Podatki i opłaty lokalne. Komentarz*, Wolters Kluwer, Warszawa 2020, p. 20.

government that meets the important needs of the inhabitants⁸. This study aims to assess the use of methods of implementing tax authority using the example of municipalities. By assessing the extent to which delivery methods are used, actions can be taken to better cope with the problems of limited financial resources and increased expenditure. The study discusses the essence of financial and tax governance and the methods of their implementation. The methods used were analyzed in terms of their potential impact on local fiscal policy. In the literature on the subject, in the studies of domestic authors, the analysis of financial independence or income lost due to tax changes is most often performed.

The essence of financial and tax governance

Sovereignty is an extremely broad category and can, therefore, be divided into many different types. First of all, from the general concept of sovereignty, one can distinguish financial sovereignty, which can be divided into state financial sovereignty, local financial sovereignty, as well as income financial sovereignty and expenditure financial sovereignty⁹. The first of these divisions is based on the criterion of the subject having sovereignty. The second one is according to the criterion of the direction of cash flow. The primary and independent owner of financial power, which is its attribute and testifies to its sovereignty, is the [nation] state as the highest and superior public-law entity. The separation of other public-law unions within the state is inextricably linked with the delegation of some tasks and appropriate financial resources to their implementation.

Financial decentralization is, thus, connected with the need to decentralize financial power and, at the same time, is an integral part of the taxing power. The financial power of a commune is the foundation of a broader and more general category, which is the independence of local government units. Independence is an attribute of local government. However, this concept is ambiguous (we distinguish independence: political, administrative, or financial)¹⁰. It manifests itself as the possibility to decide about one's own affairs under the applicable law, independently of other entities. Independence means that the commune can carry out tasks on its own responsibility. This does not mean, however, that it is free to legislate. It results, among other things, from the principle of decentralization enshrined in the Polish Constitution¹¹ or the European Charter of Local Self-Government¹². In this respect, it is the provisions of law that determine the scope within which the commune may enact local law. The activities of the local government are determined by the acts at central level and the normative acts of the local government. However, it should be noted that most of the tasks carried out by local governments are tasks imposed, to a large extent, by the state through statutes. This creates a kind of danger in terms of

⁸ R. Marks-Bielska, J. Kozajda: Gospodarowanie budżetem gminy w kontekście funkcjonowania gospodarki lokalnej, *Humanities and Social Sciences* 23, 25 (3/2018), p. 202.

⁹ P. Mańczyk: Władztwo finansowe jednostek samorządu terytorialnego w kontekście uprawnień gminy, *Ekonomiczne Problemy Usług* 4/2018, p. 209.

¹⁰ E. Ruśkowski, J.M. Salachna: *Finanse lokalne po akcesji*, Oficyna Wydawnicza Wolter Kluwer Business, Warszawa 2007, p. 27-28.

¹¹ Konstytucja Rzeczypospolitej Polskiej z dnia 2 kwietnia 1997 r. uchwalona przez Zgromadzenie Narodowe w dniu 2 kwietnia 1997 r., przyjęta przez Naród w referendum konstytucyjnym w dniu 25 maja 1997 r., podpisana przez Prezydenta Rzeczypospolitej Polskiej w dniu 16 lipca 1997 r., Dz.U. z 1997 r., nr 78, poz. 483.

¹² Europejska Karta Samorządu Terytorialnego, sporządzona w Strasburgu dnia 15 października 1985 r., Dz.U. z 1994 r., nr 124, poz. 607.

assigning responsibility for the tasks performed. The constitutional approach to the independence of local government can be analyzed in two aspects (i.e., concerning independence from government administration and based on the implementation of tasks related to satisfying the needs of residents¹³). It should be noted that independence includes systemic, organizational, administrative, legal, economic, and financial aspects. In the literature, this concept is analyzed based on economic and legal sciences¹⁴. On the basis of legal sciences, financial independence of local government is recognized as an institution of public law. Such an approach to independence has its consequences in the obligation to include regulations related to it in the act of statutory rank. The economic dimension is determined by the funds and property used to perform tasks and the right to dispose of an independent budget. Financial independence is closely related to the powers of the local government to establish its own sources of income and the freedom to spend this income adequately for the tasks performed¹⁵.

Financial independence can be defined as the scope of the decision-making independence of the local government in the context of the possibility of conducting its own fiscal policy in a given area¹⁶. The financial independence of a local government unit covers a wide range of rules and tasks that determine a local community's overall activity in meeting the local community's collective needs¹⁷. It can also be understood as the right to have sufficient funds to carry out the tasks of local government. It is also the guiding principle of the financial management of local government units. It does not imply absolute financial autonomy or self-financing.

The boundaries, in this respect, are determined by the provisions of the Constitution of the Republic of Poland and laws which list restrictions in the fields of budget planning, administration of public funds, tax authority (to the extent permitted by law), local government debt management, deficit financing, limiting restrictions (including prudential and sanction procedures), public finance discipline, and supervision and control over the activities of local government units. Income independence consists of¹⁸: equipping them with their own and indefinitely assigned sources of income and granting limited power to create this income; owning property, which can be a source of income as well as a form of security for credits and loans; having legally guaranteed access to financial markets; the possibility of operating based on a self-adopted budget.

¹³ B. Pachuca-Smulska: Samodzielność jednostek samorządu terytorialnego na przykładzie działań powiatowego (miejskiego) rzecznika konsumentów. *Zarządzanie publiczne, Funkcjonowanie jednostek samorządu terytorialnego, w aspekcie wielowymiarowym, Przedsiębiorczość i Zarządzanie*, 8, 2, 1/2017, p. 136.

¹⁴ W. Miemiec: Europejska Karta Samorządu Terytorialnego jako zespół gwarancji zabezpieczających samodzielność finansową gmin – wybrane zagadnienia teoretyczno-prawne, *Samorząd Terytorialny*, 10/1997, p. 56.

¹⁵ T. Uryszek: Samodzielność finansowa jednostek samorządu terytorialnego. *Polska na tle wybranych krajów Unii Europejskiej, Finanse Komunalne*, 12/2015, p. 5.

¹⁶ M. Poniatowicz: Determinanty autonomii dochodowej samorządu terytorialnego w Polsce, *Nauki o Finansach* 1 (22)/2015, p. 15-16.

¹⁷ A. Kawecka, G. Zalas: Gmina jako jednostka samorządu terytorialnego podmiotem odpowiedzialnym za realizację zadań z pomocy społecznej na przykładzie domów pomocy społecznej, [in:] M. Stec, K. Malysa-Sulińska (eds), *Podmiotowość samorządu terytorialnego a zakres jego zadań i kompetencji*, Wolters Kluwer, Warszawa 2020, p. 176.

¹⁸ K. Brzozowska, M. Kogut-Jaworska: Władztwo podatkowe w ocenie samodzielności dochodowej gmin w Polsce, *Annales Universitatis Mariae Curie-Skłodowska Lublin–Polonia, Sectio H, L.* 1/2016, p. 328.

The power of creating income is part of financial power. Financial power includes power in the sphere of expenses and the budget. The realization of the financial power of the commune should be considered the fact that the commune can accumulate income at its own discretion to carry out the public tasks entrusted to it. Running your own financial management is an inseparable attribute of the commune's activity. Financial sovereignty boils down to pursuing an independent policy (mainly in terms of income) with the possibility of taking advantage of imperative measures. The financial sovereignty of a commune can be analyzed concerning various legal constructions. They include: enacting local regulations by way of resolutions, issuing individual administrative acts, concluding administrative agreements, concluding civil law contracts, and establishing commercial law companies. The special nature of the commune's financial control is manifested by the enactment of local law. This is done in areas such as the financial economy and the tax economy. Individual tax decisions are issued, and financial relations of a civil law nature are created (e.g., issuing local government bonds, taking out loans and borrowings¹⁹). The shape of such rules is defined in legal provisions that have the rank of an act.

Financial sovereignty should be considered on two levels. On the one hand, it is financial dominance manifested in the enactment of a law in a given commune; on the other hand, it is in the area of law enforcement. The financial power of the commune is regulated by law and exercised within the framework of the law. It is subject to the supervision and control of other state bodies that are independent of state bodies. The fact that the commune has the above-mentioned sovereignty leads to a situation in which it is perceived as an independent entity and capable of performing public tasks. The essence of the commune's financial control consists of the possibility of creating conditions for the independent realization of one's own and commissioned tasks. This goal can be achieved by adequately equipping the commune with financial resources and, at the same time, allowing it to administer these resources on its own. In the context of financial self-government income dominance, a certain separate category is tribute dominance²⁰. They can be divided into: tax ruling, fee ruling, and ruling over other public levies. Some authors believe that there is no need to divide the power of the tribute into that which is to be state and local²¹. However, such a division seems necessary as it is already taking place at the level of financial governance. The natural consequence of this division also comes down to the level of tribute dominion. However, such a division does not mean that the two categories are equal. The existence of tribute control results from the fact that the state needs the resources necessary to carry out its tasks. Therefore, it must have appropriate instruments that allow it to obtain funds that will later be redistributed to meet social needs. One such instrument is the law to establish taxes. In Polish legislation, the rule of tribute is enshrined in Article 168 and Article 217 of the Polish

¹⁹ J. Boć: *Nauka administracji Podręcznik Uniwersytecki*, Kolonia Limited, Warszawa 2013, p.79.

²⁰ K. Bandarzewski. P. Chmielnicki: *Prawo samorządu terytorialnego w Polsce*, Beck, Warszawa 2012, p.80.

²¹ P. Mańczyk P: *Władztwo finansowe...*, 2018, *op. cit.*, p. 209.

Constitution. Article 168 stipulates that every citizen of the Republic of Poland is obliged to bear public burdens and benefits, including taxes, specified in the law²².

Tax jurisdiction can be defined as “a legally defined scope of powers to make independent decisions in tax matters”²³. This general approach requires pointing to its two levels: territorial and material. The territorial aspect of tax jurisdiction determines the territory in which this jurisdiction is exercised. Its range is equivalent to the area of a commune, county/local authority, Voivodeship (region/province) or the entire country. The area of jurisdiction in tax matters of a given public-law entity must be identical to the territorial range of that entity’s operations. Another level is the material aspect of dominion as it determines the actual scope of tax jurisdiction.

The material aspect indicates the competencies and rights of the commune or the state in tax matters. It is the right to impose taxes, the right to introduce taxes at will, the right to collect benefits from taxes (i.e., to take over the proceeds from taxes), the right to broadly understood tax administration, as well as to perform procedural activities (tax proceedings, tax liabilities) related to them. The actual material scope makes it possible to distinguish between full and partial tax jurisdiction²⁴. It is almost exclusively the domain of the state as the primary and independent public law entity. Partial tax control is shared by other public unions operating within a given state and participating in the exercise of power. It is a manifestation of the decentralization of financial power. Thus, the term local tax authority should be understood as the competence and authority to make independent decisions in some tax matters by a given local government unit, the range of which is the same as the territory of this unit. However, under the tax authority, a local government cannot independently impose levies in relation to entities within its jurisdiction to cover its needs. In relation to taxes and fees set by the state, and considered to be local government, it has the right to set their amount in the scope and within the limits of these powers specified by the Act. Determining the amount of local taxes and fees by a local government may only take place through specific elements of the tax technique.

Research methodology

The subject of the study is to present the essence of using the tax authority in communes. To achieve the goal, the resolutions of communes in 60 randomly selected communes in Poland were reviewed. In the case of 30 communes, the interview method was additionally used. Poland is divided into 2,477 communes, including 302 urban communes, 652 urban-rural communes and 1,523 rural communes (Figure 1). The types of communes and urban and rural areas in public statistics are distinguished based on the territorial division of the country using the identifiers of the National Official Register of the Territorial Division of the Country. It is a formal division based solely on an administrative criterion. The specific territory occupied by a given local government, including the commune, was

²² Konstytucja Rzeczypospolitej Polskiej z dnia 2 kwietnia 1997 r. uchwalona przez Zgromadzenie Narodowe w dniu 2 kwietnia 1997 r., przyjęta przez Naród w referendum konstytucyjnym w dniu 25 maja 1997 r., podpisana przez Prezydenta Rzeczypospolitej Polskiej w dniu 16 lipca 1997 r., Dz.U. 1997 nr 78 poz. 483.

²³ E. Tegler: Władztwo podatkowe gmin, Samorządowy Poradnik Budżetowy na 1997, Municipium, Warszawa 1997, p. 375.

²⁴ M. Kosek Wojnar: Transformacja systemu podatkowego, [in:] S. Owsiak (ed). System finansów publicznych w procesie transformacji gospodarki polskiej, PWN, Warszawa 1997, p. 154.

created on the basis of the administrative division of Poland, in which the types of communes are determined. Official statistics distinguish two types of areas: urban (including areas located within the administrative boundaries of cities – i.e., areas of urban communes and cities in urban-rural communes) and rural areas, including areas outside the administrative boundaries of cities, which include the areas of rural communes and rural parts of urban-rural communes²⁵.

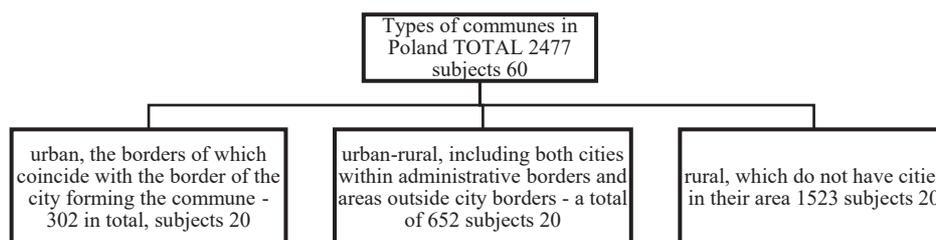


Figure 1. Types of communes in Poland

Sources: based on the Polish administrative division Podział administracyjny Polski, GUS, <https://stat.gov.pl/statystyka-regionalna/jednostki-terytorialne/podzial-administracyjny-polski/> (access: 20.12.2022).

The internal factors differentiating communes include development potential (condition and structure of resources), type of commune (urban, urban-rural, rural), dominant industries, spatial development, demographic situation, and conditions for the development of economic entrepreneurship. The external factors include legal regulations (e.g., affecting the commune's tax revenues), general economic situation, the commune's location in relation to larger urban centers, communication centers, and communication routes. The analysis used information from 20 urban communes, 20 urban-rural communes, and 20 rural communes. The analysis of the implementation of tax governance in communes related to local taxes (with taxes as compulsory and, at the same time, non-returnable cash benefits constitute the main source of financing public tasks). Income, apart from financing current operations, also enables the creation of specific policies by local authorities²⁶. They are a reliable source of financing for the directions of commune development adopted for implementation (i.e., investment plans and outlays for investment expenditures). The commune's own income are characterized by the possibility of creating their amount and collecting it on their own. Subsidies and subsidies are excluded from this group, and their amount does not depend directly on the commune. The occurrence of local taxes was a natural consequence of the establishment of local government. To simplify it, it can be assumed that local taxes constitute the entire income of local authorities. There is no legal uniform definition of local taxes, but from the point of view of public finance law, they include those taxes with respect to which local government units have tax jurisdiction. The scope of local taxes is listed in the Act on Local Taxes and Fees, which does not close the catalog of these taxes. They also include other benefits, regulated

²⁵ M. Borawska: Obszary wiejskie w statystyce publicznej, *Roczniki Kolegium Analiz Ekonomicznych*, 44/2017, p. 277.

²⁶ K. Surówka: Wpływ źródeł dochodów na kształtowanie poziomu nadwyżki operacyjnej na działalność rozwojową jednostek samorządu terytorialnego, *Finanse Komunalne*, 7-8/2019, p. 51.

by applicable laws, that meet the adopted criteria. The category of local taxes includes real estate tax, tax on means of transport (regulated by the Act on Local Taxes and Fees), agricultural tax, forest tax, income tax paid in the form of a tax card, inheritance and donation tax, and tax on civil law transactions. Concerning taxes, their main function is the fiscal function that allows them to obtain cash. These funds are necessary to cover the expenses related to meeting public needs. The secondary function of taxes relates to the redistribution of income. It allows the budget revenues obtained from taxes to be divided between citizens and public law unions²⁷. In the case of taxes, one can also speak of a third function, which is referred to as the ‘stimulus function’. It is associated with the statement that lowering or increasing tax rates, or introducing tax reliefs or exemptions may trigger desirable economic processes from the viewpoint of citizens and the state. In the area of financial management, it should be noted that the competencies and powers are used to operate in the field of tax authorities. The provision of the Constitution of the Republic of Poland (Art. 168) gave communes the right to the so-called “tribute power” in modeling tribute loads²⁸. It should be noted that the limits of tax jurisdiction result from Art. 217 of the Polish Constitution. According to its provisions, the imposition of taxes, other public levies, determination of entities, objects of taxation and tax rates – as well as the rules for granting reliefs, redemptions and categories of exempt entities – are reserved for the Act. This means that the Act regulates all the basic structural elements of the tax. The powers of communes to co-decide on the legal structure of taxes are small. Municipalities can only reduce them. This means that communes have statutory powers to regulate certain structural elements of the tax by way of a resolution. These powers relate to²⁹ shaping tax rates – determining and differentiating their amounts and shaping objective exemptions (subjective exemptions are reserved for the Act). The possibility of regulation applies only to taxes and fees paid by the municipal tax authorities. This applies to real estate tax³⁰, agricultural tax³¹, forest tax³² and tax on means of transport³³, as well as market³⁴, local³⁵, spa³⁶, dog ownership³⁷, advertising, operating³⁸ and fiscal charges³⁹, and other fees regulated by the provisions of other acts. Collection of all fees under the Act on Local Taxes and Fees (market, local, health resort, dog ownership, and advertising fees) depends on the decision of the commune council because they are optional. The communes do not have any powers in the field of taxes, which are collected by the tax authorities. Thus,

²⁷ W. Grześkiewicz (ed.): *Finanse Publiczne z elementami prawa podatkowego*, Difin, Warszawa 2014, p. 109

²⁸ R. Przygodzka: *Władztwo podatkowe a stabilność finansowa, Nierówności Społeczne a Wzrost Gospodarczy* 40, 4/2014, p. 334.

²⁹ L. Etel: *Czego mogą dotyczyć uchwały podatkowe jednostek samorządu terytorialnego*, [in:] C. Kosikowski (ed.), *Finanse samorządowe*, Dom Wydawniczy ABC, Warszawa 2006, p. 125-127.

³⁰ Ustawa z dnia 12 stycznia 1991 r. o podatkach i opłatach lokalnych, tekst jednolity, Dz.U. z 2022 r., poz. 1452.

³¹ Ustawa z dnia 15 listopada 1984 r. o podatku rolnym, Dz.U. z 2020 r., poz. 333.

³² Ustawa z dnia 30 października 2002 r. o podatku leśnym, Dz.U. z 2019 r., poz. 888.

³³ Ustawa z dnia 12 stycznia 1991 r. o podatkach i opłatach lokalnych, tekst jednolity Dz.U. z 2022 r., poz. 1452.

³⁴ *Ibidem*.

³⁵ *Ibidem*.

³⁶ *Ibidem*.

³⁷ *Ibidem*.

³⁸ Ustawa z dnia 9 czerwca 2011 r. – Prawo geologiczne i górnicze, Dz.U. z 2019 r., poz. 868.

³⁹ Ustawa z dnia 16 listopada 2006 r. o opłacie skarbowej, Dz.U. z 2022 r., poz. 2142.

conducting one's own tax policy is implemented to a very limited extent. It allows you to carry out activities of an individual, not systemic nature⁴⁰. The shaping of tax rates may be carried out as follows: directly – it consists of determining and differentiating tax rates (real estate tax, tax on means of transport and all the above-mentioned fees); indirectly – it consists of modifying the tax base (lowering the purchase price of rye and wood adopted for the calculation of agricultural and forest tax, respectively). Establishing and differentiating rates is limited by law. The legislator included in the Act on Local Taxes and Fees information on rates concerning real estate tax (Art. 5), tax on means of transport (Art. 10), and fees (Art. 19). The upper limits of tax rates are announced annually by the minister responsible for finance. The limits of these commune authorities in their tax resolutions may not exceed. In the case of the agricultural and forestry tax, the President of the Central Statistical Office defines the upper limit of the prices of raw materials (rye and wood) in the form of an annual announcement. Tax policy concerning tax rates is subject to further restrictions. You cannot set tax rates at 0 PLN. It is also not possible for commune authorities to introduce apparent rates (i.e., rates close to 0 PLN). In the tax on means of transport, the legislator also introduced minimum rates, so municipalities adopt their rates from a certain range. Limited action has been granted to municipalities in terms of differentiating tax rates due to the subject of taxation. The procedure of determining the rates requires the observance of certain rules⁴¹. The introduction of new rates should be made prior to the submission of the draft budget to the commune council. This will allow the adoption of a financial plan consistent with the adopted changes in tax revenues. The second important rule is to pursue a clear and transparent tax policy (i.e., to introduce permanent rules for shaping tax rates). Among them, the following are distinguished: the rate of growth of local rates (along with the increase in the upper limits of rates announced by the Minister of Finance at least once every three years), the reduction of the ratio of adopted rates to the level of 90% of the maximum rates, and changes in local rates (only in those years when the cumulative rate of changes in upper rates limits on tax rates exceeds 5%). One should not introduce abrupt changes and artificially maintain their constant growth.

Results

As a result of the analysis carried out in selected municipalities in the period 2019-2021, the power to make decisions in the field of determining the amount of taxes and local fees and the application of tax preferences was exercised in all municipalities. It can be concluded that the powers of municipalities in the field of tax administration are systematically used. These activities include shaping tax rates or the tax base, introducing objective exemptions and giving tax reliefs. The commune authorities also used redemptions and allow paying in installments. These activities [of the communes] were an element of building the tax policy, which is used as an instrument to stimulate the socio-economic development of the commune. These activities also had a specific effect on the financial stability

⁴⁰ R.I. Dziemianowicz, A. Kargol-Wasiluk, A. Bołtromiuk: Samodzielność finansowa gmin w Polsce w kontekście koncepcji *good governance*, *Optimum. Economic Studies* (94), 4/2018, p. 210.

⁴¹ M. Kogut-Jaworska: Instrumenty interwencjonizmu lokalnego w stymulowaniu rozwoju gospodarczego, CeDeWu, Warszawa 2008, p. 96-97.

of the commune; they had an impact on the income level. These activities were highly diversified in the analyzed communes.

In 2019, the possibility of shaping tax rates, giving tax reliefs and exemptions, as well as shaping the terms of payment of taxes for agricultural, forest, real estate, and means of transport was much higher than in 2020 and 2021 in all types of municipalities. Urban and urban-rural communes reduced rates more often (80% in the study group) than rural communes (75%). Redemptions and dismissals were used by about half of all communes.

In 2020 these measures were used in 90% of the surveyed municipal districts, most often in the field of real estate tax. And in rural districts the agricultural and forestry tax were used in all analyzed municipalities. However, redemptions and layoffs were implemented less frequently and aligned with the desired objectives.

In 2021, in principle, real estate tax was implemented at the maximum amount in all municipalities. Rural communes also used their powers not to reduce rates. 95% of all municipalities limited redemptions and layoffs (Table 1).

Table 1. The structure of the use of instruments in the surveyed communes in 2019-2021

Type:	A			B			C		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Lowering the top tax rates									
property tax	80	90	35	75	70	35	75	80	20
tax on means of transport	75	70	70	65	60	55	70	70	65
agricultural tax	0	0	0	0	5	5	15	10	5
forest tax	0	0	0	0	5	5	10	10	5
Discounts and exemptions									
property tax	75	70	60	60	55	45	65	50	45
tax on means of transport	60	65	50	50	45	45	55	50	40
agricultural tax	0	0	0	5	10	5	20	15	15
forest tax	0	0	0	5	5	5	15	10	10
Write-off of tax arrears									
property tax	45	35	15	45	30	10	50	35	10
tax on means of transport	35	30	20	30	30	20	45	35	30
agricultural tax	0	0	0	10	10	5	20	20	5
forest tax	0	0	0	5	5	5	10	10	5
Payments in installments and deferrals									
property tax	10	10	5	20	15	15	20	10	10
tax on means of transport	10	10	5	15	10	10	15	15	10
agricultural tax	0	0	0	5	5	5	10	10	10
forest tax	0	0	0	0	0	5	15	10	5

Analyzed communes: A – municipal commune; B – urban-rural commune; C – rural commune.

Sources: own study based on research.

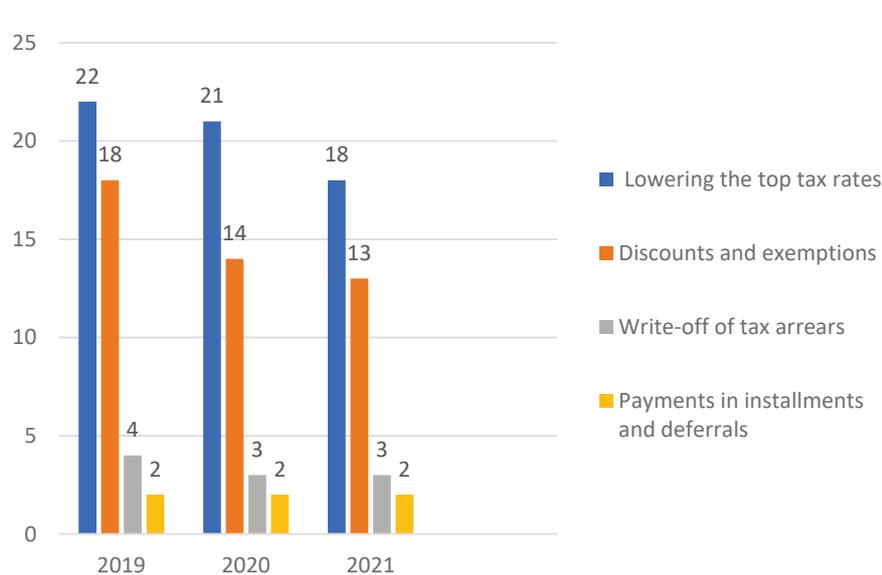


Figure 2. Share of lost tax revenues in the surveyed communes in years 2019-2021

Sources: own calculation based on the analysis of data from commune budgets

An analysis of the lost revenue of municipalities in the period under review shows less revenue from tax revenues. Due to the reduction of upper tax rates in all local taxes, it is about 22-18% less revenue with a decreasing trend. Another group that generates a significant level of lost revenue is the use of abatements and exemptions. Across all municipalities surveyed, this is about 17%, most often within real estate tax. To a lesser extent, municipalities make use of the power to write off tax arrears (3% of lost revenue) and to spread or defer payment in installments (2% of lost revenue) (Figure 2). The consequence of municipalities exercising tax authority is the loss of some revenue. During the period under review, municipalities deliberately gave up part of their tax revenues. The highest impact on the reduction of municipal tax revenues was the reduction of upper tax rates. To the greatest extent, both in value and relative terms, the loss of revenue from tax authority occurs in rural municipalities, which are often in financial distress and receive budget revenues mainly from subsidies and grants. During the period under review, they gave up part of their own revenues from local taxes. The financial stability of municipalities is mainly determined by their own revenues. According to respondents, reducing revenues through tax authority threatens financial stability.

The use of lower tax rates and the introduction of exemptions, concessions and amortizations reduce the budgetary revenues of municipalities. Thus, the effects of applying tax jurisdiction can be described as lost income. In 2020 and 2021, there was an unplanned increase in expenditure and a decrease in incomes in municipalities due to the effects of the COVID-19 pandemic. Municipalities face a huge problem, which is a significant decrease in their own income mainly income from PIT, CIT, real estate taxes, as well as income from rents. On the other hand, every day, they struggle with the problems of

providing the residents with the required safety and incur high costs associated with it. The negative consequences associated with it are the inability to carry out already started tasks or failure to perform tasks at the current or planned level. The reason lies in the lack of financial resources. Moreover, communes, taking advantage of their powers in the field of tax authority, develop state aid programs which they try to influence potential investors. From the information obtained through the interview, all surveyed entities indicated the risk of a decrease in income and tax changes, and – thus – a legal and financial risk. They indicated it as the reason for limiting tax stimulation.

In the respondents' opinion, tax governance is an important factor influencing the financial policy of municipalities, but the use of these methods in practice in the analyzed period was very limited. The analyses show that the communes perceive the risk of legal and financial changes and mostly do not use the methods of exercising power due to the limited income and the increase in expenses related to the post-pandemic crisis. Decisions related to the tax policy formed a logical catalog of activities related to the commune's development strategy and the entities' current financial policy.

Conclusions

Certain conclusions can be drawn from the considerations presented in the study. Municipalities are aware of their competencies and public obligations. The realization of the commune's self-government is evidenced by the fact that the local community can decide on social and economic matters at the local level. Management in a commune is treated as a set of decision-making processes that create appropriate conditions for the implementation of the adopted goals and tasks and fulfilling needs. The basic one is the optimal use of the resources at hand to implement the goals and directions of activities set in the commune.

Financing is an extremely complex task due to growing and changing social needs. It is a great management challenge and the ability of decision-makers to assess risk. In terms of the implemented tax policy, the possibility of shaping tax rates, giving tax reliefs and exemptions, and shaping the terms of payment applies only to taxes: agricultural, forest, real estate, and means of transport. The most frequently implemented activity of communes was the reduction of the upper tax rates. Although in the short term, giving up part of the income may limit the possibility of the functioning or even the need to obtain additional funds in the commune in the long term, there may be a positive impact on taxpayers. However, it could be a long-term effect. In view of the weak financial situation, the decisions of the long-term effect are not implemented as activities focused on obtaining the largest possible tax revenues and implementing maximum tax rates. There is also a certain risk associated with the local tax authorities, which is the possibility of reducing budget revenues. It consists of lowering local authorities' tax rates and applying a wide range of tax reliefs, amortizations, and tax exemptions. Local governments also have greater problems with the effectiveness of tax enforcement. The effectiveness of the applied solutions in local tax policy is determined not only by the fact of using a given instrument, but also by its selection and form. The key to effective stimulation by tax sovereignty is not the mere application of preferences, but the transparency and stability of the tax system.

References

- Bandarzewski K., Chmielnicki P.: Prawo samorządu terytorialnego w Polsce, Beck, Warszawa 2012.
- Boć J.: Nauka administracji Podręcznik Uniwersytecki, Kolonia Limited, Warszawa 2013.
- Borawska M.: Obszary wiejskie w statystyce publicznej, Roczniki Kolegium Analiz Ekonomicznych, Szkoła Główna Handlowa, 44/2017, p. 275-285.
- Brzozowska K., Kogut-Jaworska M.: Władztwo podatkowe w ocenie samodzielności dochodowej gmin w Polsce, *Annales Universitatis Mariae Curie-Skłodowska Lublin–Polonia, Sectio H, L. 1/2016*, p. 327-337.
- Chochowski K.: Zadania samorządu gminnego w Polsce w sferze bezpieczeństwa i porządku publicznego, [in:] M. Stec, S. Płażek (eds), *Charakter i konstrukcja zadań samorządu terytorialnego*, Wolters Kluwer, Warszawa 2017, p. 112-136.
- Dziemianowicz R.I., Kargol-Wasiluk A., Bołtromiuk A.: Samodzielność finansowa gmin w Polsce w kontekście koncepcji good governance, *Optimum. Economic Studies (94)*, 4/2018, p. 204-219.
- Etel L., Dowgier R., Liszewski G., Pahl B.: Podatki i opłaty lokalne. Komentarz, Wolters Kluwer, Warszawa 2020.
- Etel L.: Czego mogą dotyczyć uchwały podatkowe jednostek samorządu terytorialnego, [in:] C. Kosikowski (ed), *Finanse samorządowe*, Dom Wydawniczy ABC, Warszawa 2006, p. 125-127.
- Europejska Karta Samorządu Lokalnego, sporządzona w Strasburgu dnia 15 października 1985 r., Dz.U. z 1994 r., nr 124, poz. 607.
- Grześkiewicz W. (ed.): *Finanse Publiczne z elementami prawa podatkowego*, Difin, Warszawa 2014.
- Hałat-Majka J.: Władza stanowiąca a zrównoważony rozwój samorządu terytorialnego, [in:] S. Stachera Włodarczyk, S. Cichoń (eds), *Zrównoważony rozwój w zarządzaniu*, Wydawnictwo Wydziału Zarządzania Politechniki Częstochowskiej, Częstochowa 2018, p. 22-42.
- Kawecka A., Zalas G.: Gmina jako jednostka samorządu terytorialnego podmiotem odpowiedzialnym za realizację zadań z pomocy społecznej na przykładzie domów pomocy społecznej, [in:] M. Stec, K. Malysa-Sulińska (eds), *Podmiotowość samorządu terytorialnego a zakres jego zadań i kompetencji*, Wolters Kluwer, Warszawa 2020, p. 173-191.
- Kogut-Jaworska M.: *Instrumenty interwencjonizmu lokalnego w stymulowaniu rozwoju gospodarczego*, CeDeWu, Warszawa 2008.
- Konstytucja Rzeczypospolitej Polskiej z dnia 2 kwietnia 1997 r. uchwalona przez Zgromadzenie Narodowe w dniu 2 kwietnia 1997 r., przyjęta przez Naród w referendum konstytucyjnym w dniu 25 maja 1997 r., podpisana przez Prezydenta Rzeczypospolitej Polskiej w dniu 16 lipca 1997 r., Dz.U. z 1997 r., nr 78, poz. 483.
- Kosek Wojnar M.: Transformacja systemu podatkowego, [in:] S. Owsiak (ed), *System finansów publicznych w procesie transformacji gospodarki polskiej*, PWN, Warszawa 1997, p. 152-158.
- Mańczyk P.: Władztwo finansowe jednostek samorządu terytorialnego w kontekście uprawnień gminy, *Ekonomiczne Problemy Usług 4/2018*, p. 207-219.
- Marks-Bielska R., Kozajda J.: Gospodarowanie budżetem gminy w kontekście funkcjonowania gospodarki lokalnej, *Humanities and Social Sciences 23, 25 (3/2018)*, p. 199-211.
- Mączyński M.: *Reforma ustroju samorządu terytorialnego: uwarunkowania, możliwości i konsekwencje zwiększenia samodzielności JST, MSAP*, Kraków 2014.
- Miemiec W.: Europejska Karta Samorządu Terytorialnego jako zespół gwarancji zabezpieczających samodzielność finansową gmin – wybrane zagadnienia teoretyczno-prawne, *Samorząd Terytorialny*, 10/1997, p. 54-63.
- Pachuca-Smulska B.: Samodzielność jednostek samorządu terytorialnego na przykładzie działań powiatowego (miejskiego) rzecznika konsumentów. *Zarządzanie publiczne, Funkcjonowanie*

- jednostek samorządu terytorialnego, w aspekcie wielowymiarowym, *Przedsiębiorczość i Zarządzanie*, 8, 2, 1/2017, p. 135-147.
- Podział administracyjny Polski, GUS, <https://stat.gov.pl/statystyka-regionalna/jednostki-terytorialne/podzial-administracyjny-polski/> (access: 20.12.2022).
- Poniatowicz M., Determinanty autonomii dochodowej samorządu terytorialnego w Polsce, *Nauki o Finansach*, 1 (22)/2015, p. 11-30.
- Przygodzka R.: Władztwo podatkowe a stabilność finansowa, *Nierówności Społeczne a Wzrost Gospodarczy* 40, 4/2014, p. 334-344.
- Ruśkowski E., Salachna J.M.: *Finanse lokalne po akcesji*, Oficyna Wydawnicza Wolter Kluwer Business, Warszawa 2007.
- Satoła Ł., Standar A., Kozera A.: Financial Autonomy of Local Government Units: Evidence from Polish Rural Municipalities, *Lex Localis-Journal, Of Local Self-Government*, 17, 2/2019, p. 321-342.
- Surówka K.: Wpływ źródeł dochodów na kształtowanie poziomu nadwyżki operacyjnej na działalność rozwojową jednostek samorządu terytorialnego, *Finanse Komunalne*, 7-8/2019, p. 50-59.
- Tegler E.: *Władztwo podatkowe gmin*, w *Samorządowy Poradnik Budżetowy na 1997*, Municipium, Warszawa 1997.
- Uryszek T.: Samodzielność finansowa jednostek samorządu terytorialnego. Polska na tle wybranych krajów Unii Europejskiej, *Finanse Komunalne*, 12/2015, p. 5-15.
- Ustawa z dnia 12 stycznia 1991 r. o podatkach i opłatach lokalnych, Dz.U. z 2022 r., poz. 1452.
- Ustawa z dnia 13 listopada 2003 o dochodach jednostek samorządu terytorialnego, Dz. U. z 2021 r. poz. 1672 as amand.
- Ustawa z dnia 15 listopada 1984 r. o podatku rolnym, Dz.U. z 2020 r., poz. 333.
- Ustawa z dnia 16 listopada 2006 r. o opłacie skarbowej, Dz.U. z 2022 r., poz. 2142.
- Ustawa z dnia 30 października 2002 r. o podatku leśnym, Dz.U. z 2019 r., poz. 888.
- Ustawa z dnia 9 czerwca 2011 r. – Prawo geologiczne i górnicze, Dz.U. z 2019 r., poz. 868.
- Wołowicz T.: Konkurencyjność podatkowa gminy w kontekście posiadania lokalnej strategii podatkowej, *Samorząd Terytorialny* 7-8/2020.

Władztwo podatkowe gmin w Polsce oraz metody jego realizacji

Streszczenie

Celem opracowania było ustalenie możliwości wykorzystania metod realizacji władztwa podatkowego gmin w zakresie podatków lokalnych oraz ocena znaczenia wykorzystania władztwa dla planowania finansowego gminy w warunkach kryzysu finansów. Dla realizacji celu analizie poddano wybranych losowo 60 gmin o zróżnicowanym charakterze. Zastosowano następujące metody: analizę piśmiennictwa, analizę aktów prawnych lokalnych oraz wywiad pogłębiony i opracowania statystyczne. Do analizy przyjęto dane z lat 2019-2021. Na podstawie przeanalizowanego materiału ustalono, że występuje zróżnicowany zakres wykorzystywania metod władztwa podatkowego w gminach. Władztwo podatkowe stanowi ważny czynnik wpływający na politykę finansową gmin w opinii respondentów, ale wykorzystywanie tych metod w praktyce w badanym okresie było bardzo ograniczone. Z przeprowadzonych analiz wynika, że gminy dostrzegają ryzyko zmian prawnych i finansowych i w większości nie wykorzystują metod realizacji władztwa z uwagi na ograniczone dochody i wzrost wydatków związanych z kryzysem po pandemii.

Słowa kluczowe: lokalne podatki, władztwo podatkowe, gmina

Kody JEL: H2, H3

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THE PROVISION OF ENVIRONMENTAL BENEFITS BY SMALL FARMS FROM A REGIONAL PERSPECTIVE – SELECTED PROBLEMS

The changing model of functioning of agriculture brings new directions of its development, including functions related to providing environmental benefits. Environmental protection has become the most important point of reference in shaping all policies implemented by the European Union (EU), including the Common Agricultural Policy. Farmers, as its main beneficiaries, should take this into account. Decisions made by agricultural producers in their production processes are of great importance to the environment. The aim of the paper was to show and analyze regional differentiation of environmental benefits resulting from the functioning of small farms on the example of selected farm characteristics. The data for the analysis was obtained from the System of Collection and Use of Farm Accounting Data (Polish FADN) from three years (2017, 2018 and 2019). On the basis of a comparative and statistical analysis, it was concluded that the provision of environmental benefits by small farms is regionally differentiated. Soil protection and pro-environmental measures are emphasized in the Common Agricultural Policy's new arrangements for 2023-2027. This will primarily require knowledge transfer at the level of the institutional environment of agriculture (primarily of an advisory nature) at the national and regional level.

Keywords: environmental protection, small farm, region, differentiation
JEL Codes: Q12, Q18

Introduction

The discussion on environmental protection is a key issue today and absorbs the attention of numerous national and international forums. Environmental issues are present everywhere in the modern world, and their circle continues to expand¹. Over the last two decades, the Common Agricultural Policy (CAP)² has undergone a gradual change from market intervention instruments (e.g., price support) to farm-specific measures attempting to enhance the environmental performance of the EU agricultural sector. In every sector of the economy, especially in the European Union (EU), there has been a recent intensification of activities emphasizing the environmental aspect. The changing paradigm of rural areas and agriculture implies that one of the essential elements of land management will be the provision of environmental services³. Agriculture significantly affects the environment. The environmental effects of individual activities can positively or negatively affect

¹ A. Jaworowicz-Rudolf: Środowisko jako dobro chronione, [in:] Z. Duniewska (ed.), *Dobra chronione w prawie administracyjnym*, Uniwersytet Łódzki, Łódź 2014, p. 176.

² K. Louhichi, P. Ciaian, M. Espinose, A. Perni, S. Gomez y Paloma. Economic impacts of CAP greening: application of an EU-wide individual farm model for CAP analysis (IFM-CAP), *European Review of Agricultural Economics* 45, 2/2018, p. 205.

³ R. Baum, J. Śleszyński: Nowe funkcje rolnictwa – dostarczanie dóbr publicznych, *Zeszyty Naukowe Stowarzyszenia Rolnictwa i Agrobiznesu* 11, 2/2020, p. 19.

the quality of public goods produced/provided by agriculture⁴. The environmental benefits of small farms include providing public goods by maintaining biodiversity and diversity in the rural landscape, practicing environmentally friendly farming, or sustaining the vitality of problem areas such as less favored areas⁵. According to the Act⁶ of 27 April 2001 Environmental Protection Law, (Article 3, Point 39) the environment is all natural elements, including those transformed as a result of human activity—in particular, the Earth's surface, minerals, waters, air, landscape, climate, and other elements of biodiversity, as well as the mutual interaction between these elements. Resources and values of the environment are public goods, and protecting the environment in the sense of reducing and eliminating threats which may negatively influence its condition meets the assumptions of public goods. In the case of public goods, it is impossible to exclude anyone from their consumption (non-excludable goods) with a simultaneous lack of rivalry (non-rivalrous goods). In solving environmental problems, the direction of agricultural development is particularly important⁷. From the point of view of environmental benefits in agriculture, organic production is important. By its nature, it can be considered as one of the basic tools for providing environmental services. Organic farming⁸ is a crop production method respecting the rules of nature, targeted to produce nourishing, healthy and pollution-free food. With regard to public goods, the generation of positive externalities is important. Public goods in their theoretical and empirical content should become the subject of broad economic analysis – in particular, concerning agriculture and rural areas⁹.

Research methodology

The research material consisted of data obtained from the System for Collection and Use of Farm Accountancy Data – Polish FADN – Farm Accountancy Data Network (FADN PL) from three years (2017, 2018, and 2019). The analysis was performed on small farms separated by economic size, for which the range of standard output (SO) is below EUR 25,000. The analysis of data on individual farms was presented according to four designated regions in Poland: Pomorze and Mazury, Wielkopolska and Śląsk, Mazowsze and Podlasie, and Małopolska and Pogórze. The regions were assigned national symbols, A, B, C, and D, respectively. The symbolism of the regions was used in the tabular and graphic representations and the data analysis in the paper. To analyze the influence of small farms on the environment, data from the Polish FADN System was obtained on average per one small farm. The aim of the paper was to show and analyze the regional differentiation of small farms from the point of view of environmental benefits, which are the effect of selected agricultural practices or possessed resources:

⁴ I. Duer: Dobra publiczne użytkowane i dostarczane przez rolnictwo – wspierane w ramach programu rozwoju obszarów wiejskich, *Studia i raporty IUNG-PIB*, 21/2010, p. 85.

⁵ M. Czekaj, M. Szafrńska, K. Żmija, Ł. Satoła, A. Płonka, D. Żmija, E. Tyran, J. Puchała: Rola małych gospodarstw rolnych. Diagnoza i perspektywy na przyszłość na przykładzie Podregionu Rzeszowskiego, *Difin*, Warszawa 2020, p. 57.

⁶ Ustawa z dnia 27 kwietnia 2001 r. Prawo ochrony środowiska, *Dz.U.2001 Nr 62 poz. 627*.

⁷ A. Ginter: Małe gospodarstwa rolne wobec wyzwań zrównoważonego rozwoju i Zielonego Ładu, *Uniwersytet Przyrodniczo-Humanistyczny w Siedlcach*, Siedlce 2021, p. 7.

⁸ E. Somasundaram, D. Udhaya Nandhini, M. Meyyappan: Organic crop production techniques, [in:] E. Somasundaram, D. Udhaya Nandhini, M. Meyyappan (eds), *Principles of organic farming*, CRC Press, London 2021, p. 252.

⁹ M. Maciejczak: Rolnictwo i obszary wiejskie źródłem dóbr publicznych – przegląd literatury, *Zeszyty Naukowe SGGW w Warszawie. Ekonomika i Organizacja Gospodarki Żywnościowej*, 75/2009, p. 131.

1. Having organic production – the share of organic farms producing only by organic, the organic and conventional methods;
2. Having forests in the land resources – forest area on average per 1 small farm (ha);
3. The area of winter cover on average per one small farm (ha), cultivation of winter catch crops – share of small holdings using this type of catch crops (%);
4. The area of winter catch crops on average per one small agricultural holding (ha);
5. The importance of public goods subsidies – share of public goods subsidies in total subsidies (%).

The selection of agricultural practices (1-4) presented in the article was based on current discussions about soils. Increasing attention is being paid to the quality of soils, their functions, and the ecosystem services they provide. The subjective treatment¹⁰ of soils is pointed out, and their importance in the human economy – especially in areas such as agriculture – is emphasized. These practices are important for the quality of the soil, and this is influenced by the farmer.

Among subsidies that agricultural producers receive under the Common Agricultural Policy (CAP), there are set-aside subsidies, agri-environmental subsidies, subsidies for less favored areas, and rural development subsidies which, according to Grzelak¹¹, are subsidies for public goods (which is assumed in this paper). The greater the share of these subsidies, the more beneficial for the environment. The most important characteristics of public goods are non-excludability and non-rivalry. These two characteristics imply that users have no incentive to pay for the consumption of such goods and, on the supply side, there are no incentives for providing public goods because the producers, such as the farmers, are not remunerated by the market to do. According to Francesco Vanni¹², the combination of these factors explains the so-called “market failure”, and the reason for the need for public intervention in order to achieve a socially optimal level of public goods, consistent with societal demand. This approach explains the choice of the last feature described the share of public goods payment in total direct payment (5).

The method of data analysis, as well as the tabular and graphic methods of the collected material, were used in this paper. The one-way analysis of variance was used to compare the regions in terms of selected characteristics. For characteristics whose distribution was not close to normal, the Bliss transformation and the square root transformation ($y = \sqrt{x + a}$) were applied. The Tukey test was used to compare means at the significance level of $p \leq 0.05$. All calculations were made in Statistica 12.0¹³.

Results

In the surveyed years in the field of observation of the Polish FADN, the number of small farms by economic size, below EUR 25,000, was increasing (Table 1). On average, in Poland, in the third year of research, compared to 2017, by about 13%. The highest number of them was characterized by the region of Mazowsze and Podlasie, and the lowest by

¹⁰ A. Gałązka, B. Smreczak: Jakość gleb użytkowanych rolniczo i wskaźniki jej oceny, *Studia i raporty JUNG-PIB*, 54, 8/2017, p. 7.

¹¹ A. Grzelak: Akumulacja majątku w gospodarstwach rolnych w Polsce ze względu na typy produkcyjne i kontekst paradygmatu rozwoju zrównoważonego, *Zagadnienie Ekonomiki Rolnej*, 360, 3/2019, p. 89.

¹² F. Vanni: *Agriculture and Public Goods – The Role of Collective Action*, Springer Science+Business Media, Dordrecht 2014, p. 1.

¹³ StatSoft. Inc. 2014. STATISTICA (data analysis software system), Version 12.

Pomorze and Mazury. In each of the regions, there was a growing trend in the number of described farms, and when comparing 2017 with 2019, it could be seen that in Region A the change was the largest (about 18%), and in Region D it was the smallest (about 10%).

Table 1. Small farm number in the FADN PL system by region in the years 2017, 2018, and 2019

Year	The regions				Total number of small farms in Poland
	A	B	C	D	
2017	693.0	1353.0	2147.0	775.0	4968.0
2018	768.0	1432.0	2310.0	834.0	5344.0
2019	815.0	1543.0	2392.0	856.0	5606.0

Source: own calculation based on Polish FADN data.

The first characteristic of the farms that was presented and analyzed was the use of organic ways of producing agricultural products. Organic farming is mainly based on the use of natural environmental values and processes in agrocenosis, and its promotion is one of the most important objectives of the EU in agriculture in the near future. Organic production is considered to be a farm management system that combines practices that are most beneficial to the environment and climate, which justifies the choice of the first issue addressed in the paper. This type of production is attributed to the conservation of natural resources and the maintenance of high standards relating to agricultural production. Considering the environmental benefits of organic farming, it should be said that organic agricultural production has an inherent environmental protection function. In the organic production system¹⁴, the set objective is achieved by complying with certain methods. These are very broad and deeply interfering in legal production regulations unified on the whole territory of the community, in the nature of directives and regulations. From the Polish FADN system, data on organic production methods in small farms was obtained from the database and, according to the methodology adopted in the system, farms applying only organic production methods – using both organic and conventional methods – and farms in the process of converting their production methods to organic were analyzed. Table 2 presents the first of the above-mentioned groups of farms.

Table 2. Share (%) of farms using only organic production methods on small farms by region in 2017-2019

Year	The regions			
	A	B	C	D
2017	10.1	1.3	4.8	5.3
2018	9.6	1.5	4.5	4.9
2019	9.8	1.1	3.8	3.5
Average in years	9.8a	1.3c	4.4b	4.6b

Source: own calculation based on Polish FADN data; the averages for the years marked with different letters are significantly different at $p \leq 0.05$

Small farms in the region of Pomorze and Mazury were characterized by the highest share of farms applying only organic methods (Table 2). In this area of Poland, almost every 10th small farm provided environmental benefits. In second place in terms of the described characteristics of farms was the region of Małopolska and Pogórze, where the share was, on average (in the studied years), more than twice lower as in Region A. In

¹⁴ B. Sazońska: Zasady prowadzenia gospodarstw w systemie rolnictwa ekologicznego, Centrum Doradztwa Rolniczego w Brwinowie, Oddział w Radomiu, Radom 2020, p. 5.

Mazowsze and Podlasie, similar results to the southern region of Poland were recorded, while in Wielkopolska and Śląsk, the smallest number of small farms applying exclusively organic production methods was found. The share of farms applying only organic production methods in Region B, on average in the years studied, was more than seven times lower than in Region A. In regional terms, the data for small farms with mixed production methods (Table 3) was similar to that using only organic production methods. The highest percentage was in the northern region of Poland (Region A), and the lowest in Wielkopolska and Śląsk (Region B).

Table 3. Share (%) of farms using both organic and conventional methods on small farms by region 2017-2019

Year	The regions			
	A	B	C	D
2017	1.7	0.4	0.8	1.0
2018	2.5	0.4	0.9	1.4
2019	2.2	0.4	1.0	1.5
Average in years	2.1a	0.4c	0.9bc	1.3b

Source: own calculation based on Polish FADN data; lettering as in Table 2.

Soil conservation falls within the scope of environmental goods¹⁵. The anti-erosion agrotechnology applied in the process of plant production in farms is an important element of it because of the protective function of soil, and the cultivation of winter crops is essential for it. It should be emphasized that soil is a limited resource, and the need for it is growing primarily because of the increasing demand for food or the production of energy crops.

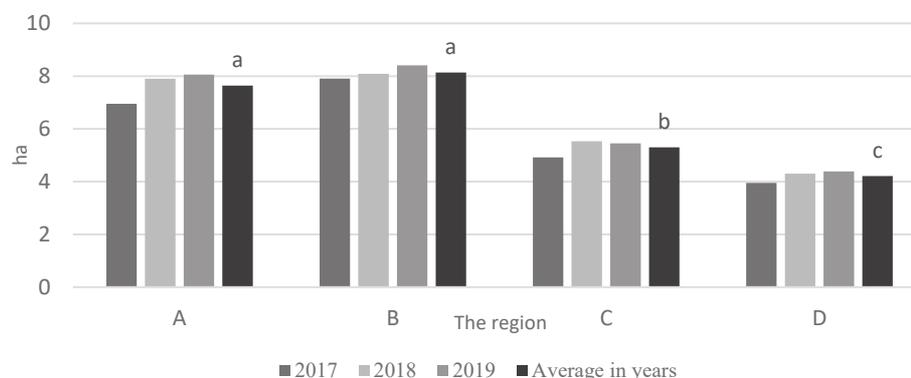


Figure 1. Winter cover area (ha) on average per one small farm by region in 2017-2019

Source: own elaboration based on Polish FADN data; lettering as in Table 2.

Winter cover is the area of winter crops to be harvested in the following year and all winter catch crops to be ploughed in the following spring. Small farms in the Wielkopolska and Śląsk regions recorded the largest average area of winter cover (Figure 1). On average, in the studied years, it was slightly larger (by 6%) than in the region of Pomorze

¹⁵ J. Wilkin: Dobra dostarczane przez rolnictwo w świetle teorii dóbr publicznych, [in:] J. Wilkin (ed.) Wielofunkcyjność rolnictwa. Kierunki badań, podstawy metodologiczne i implikacje praktyczne, IRWiR-PAN, Warszawa 2010, p. 42.

and Mazury. Smaller winter cover in small farms protected soil in the other two regions. It should be noted that an increase in winter cover area was recorded in all regions in the study period, which was beneficial for the soil. Due to the duration of their cover, winter catch crops inhibit soil erosion processes and, if left as mulch for the winter, maintain soil moisture at a higher level¹⁶. Especially valuable is the fact that they affect the number of elements contained in the soil. The number of macroelements protected from leaching from soil by winter catch crop plants was significantly lower compared to summer catch crop plants¹⁷.

Due to the beneficial effect of winter catch crops on the conservation of soil natural resources, the paper shows their area (Figure 2). The largest acreage of winter catch crops was recorded on small farms in the region of Pomorze and Mazury (A), which had a special expression in 2019. In three years in this part of the country in small farms, there was the largest, almost threefold increase in their area. A wide variety¹⁸ of changes in production methods and land uses have been promoted to farmers. Key examples included soil protection and soil quality. The key to controlling soil erosion by water is to maintain soil groundcover. Compared to the other regions, on average, in the years of research, the area of winter catch crops was more than twice as large as in Region B, almost twice as large as in C and more than seven times as large as in Region D. Based on a comparative analysis, it could be stated that in the first of the presented regions (A), soil protection resulting from the applied agrotechnical practices covered the largest area.

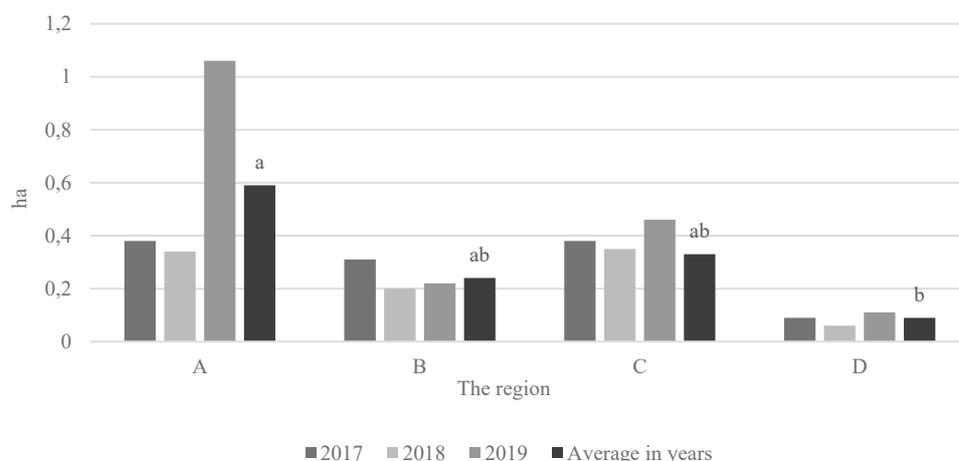


Figure 2. Winter catch crops area (ha) in small farms by region in 2017-2019

Source: own calculation based on Polish FADN data; lettering as in Table 2.

¹⁶ D. Nowak, Z. Bilski, I. Kajdan-Zysnarska: Metody wpływające na poprawę żyzności gleby, Centrum Doradztwa Rolniczego w Brwinowie, Oddział Poznań, Poznań 2019, p. 22.

¹⁷ A. Zaniewicz-Bajkowska, J. Franczuk, R. Rosa, E. Kosterna: Nawozy zielone na Mazowszu, Urząd Marszałkowski Województwa Mazowieckiego w Warszawie, Warszawa 2012, p. 44.

¹⁸ D. Pannell, A. Roberts: Public goods and externalities: Agri-environmental policy measures in Australia, OECD Food, Agriculture and Fisheries Papers No 80, OECD Publishing, Paris 2015, p. 10.

Forests play an important role in the environment and have a beneficial effect on the climate and the balance of nature. They emphasize the uniqueness of the agricultural landscape and are an environmental asset. The highest average forest area per farm was observed in Mazowsze and Podlasie regions (Figure 3). It was slightly smaller than in the regions of Pomorze and Mazury and Małopolska and Pogórze. A much smaller area of forest land was found in small farms in Wielkopolska and Śląsk regions. Sustainable management must take into account the preservation of forests and their beneficial impact on the climate and natural balance¹⁹. The need to protect the forest and maintain the continuity of the multifaceted functions performed by forests is becoming increasingly important²⁰. The demand for the forest's social functions forest is increasing²¹.

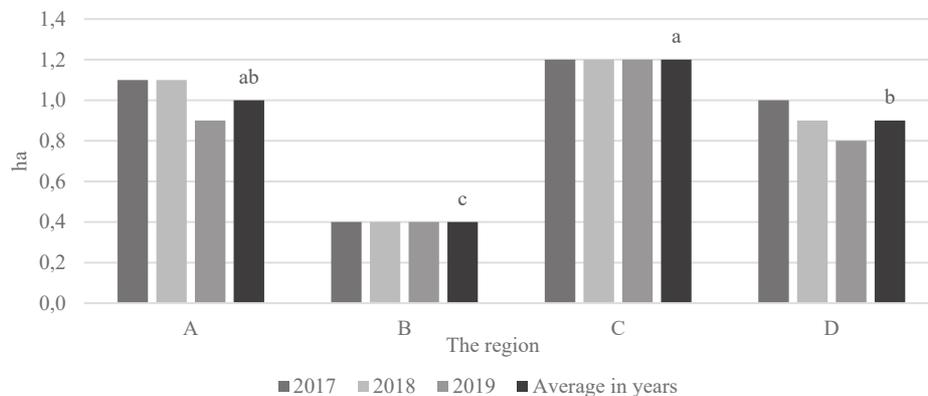


Figure 3. Forest area (ha) on average per one small farm by region in 2017-2019

Source: own elaboration based on Polish FADN data; lettering as in Table 2.

The last selected issue in the study concerning the provision of environmental goods by small farms was the share of payments for so-called “public goods” in total payments (Figure 4). As mentioned in the methodology of the paper, in the group of payments received by agricultural producers, four types of financial support (i.e., agri-environmental payments, set-aside payments, payments to less favored areas and rural development payments) are considered public goods payments. In the surveyed years, the share of these subsidies was the largest in small farms located in Region A – Pomorze and Mazury. In this area of Poland, more than one-fifth of the received support included subsidies for public goods. In other regions, the characterized subsidies were less important. In the regions Mazowsze and Podlasie by 4.5% (on average in 2017-2019), and in the regions

¹⁹ M. Machoń: Gospodarka leśna w obliczu potrzeb ochrony przyrody, *Roczniki Administracji i Prawa*, 13/2013, p. 158.

²⁰ B. Olejniczak, M. Maciantowicz: Zagrożenia biotyczne i abiotyczne na terenie Leśnego Kompleksu „Bory Lubuskie” i podejmowane działania zapobiegawcze, *Inżynieria Środowiska*, 13/2007, p. 330.

²¹ J. Glura: Wielofunkcyjne leśnictwo jako element dobrobytu człowieka, [in:] K. Kanenberg, H. Szramka (eds), *Zarządzanie ochroną przyrody w lasach*, Wyższa Szkoła Zarządzania w Tucholi, Tuchola 2007, p. 136.

Małopolska and Pogórze by 5.5%. In the Wielkopolska and Śląsk regions, the importance of the subsidies in question was the lowest, and their share of the examined years (on average, 2017-2019) amounted to 14.6%. It should be noted that in subsequent years of research, only in Region A the share of these subsidies slightly increased. In other regions it fluctuated (Region D), and in the other two (B and C) it decreased. During one rotation period²² (for example, 100 years), the requirements of society from forests changed dramatically; from sole timber production to increased timber production, as well as other functions such as maintenance of biodiversity, recreation drought and flood control, and erosion control.

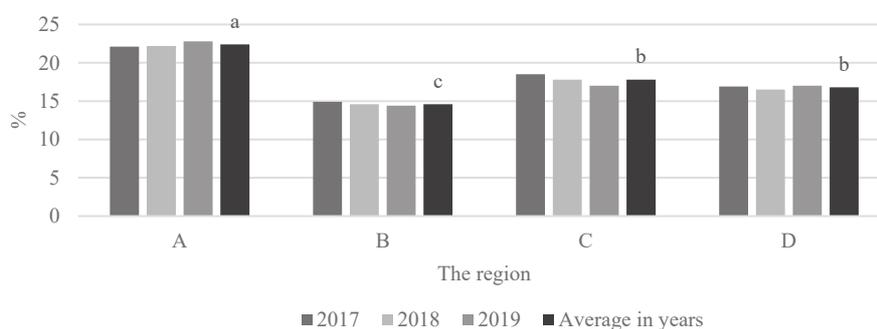


Figure 4. Share (%) of public goods payments in total direct payments

Source: own calculation based on Polish FADN data; lettering as in Table 2.

In small farms located in the regions of Pomorze and Mazury (A), the share of CAP support for public goods was the highest, which meant the most favorable situation, compared to the other regions (from the perspective of environmental protection). In the remaining regions (B, C, D), the results were at a similar level, but in Wielkopolska and Śląsk, the share of the subsidies in question was the lowest. Ecological safety for the present and future generations is to be ensured by every type of policy implemented, among others, the EU, including the Common Agricultural Policy affecting production processes shaped by agricultural producers. European public goods provided to the EU citizens are financed from its budget and fulfil the characteristics of national public goods²³. It should be added that the agricultural policy aims to support the development of rural areas and is an attempt to apply the laws of economic theory in practice in order to achieve objectives set by the state²⁴. These objectives, in recent times, relate primarily to environmental protection, and each country in the EU, including Poland, treats it as a priority. Public support, established by the CAP²⁵ and provided by the Rural Development Program (RDP), is now

²² L. Salek, A. Sivacioğlu: Forests for future – multifunctional forests, *International Journal of Plant and Soil Science*, 24 (6)/2018, p. 1.

²³ A. Biernat-Jarka: Dobra publiczne w rolnictwie w nowej perspektywie finansowej Unii Europejskiej, *Zagadnienia Ekonomiki Rolnej*, 1 (346)/2016, p. 147.

²⁴ M. Wigier, M. Podstawka: Measurement of the effectiveness of public aid for farms in Poland, *Polityki Europejskie, Finanse i Marketing*, 26 (75)/2021, p. 68.

²⁵ L. Melece, I. Shena: Valuation of public goods and ecosystems services providing by agriculture. *Engineering For Rural Development 2018., Conference paper: Proceeding 17th International Scientific Conference Engineering for Rural Development, Jelgava, 23-25.05.2018, p. 1229.*

increasingly oriented towards the provision of environmental and other public goods. Sustainable agriculture²⁶ will require that society appropriately rewards ranchers, farmers and other agriculturalists for the production of both food and ecosystem services. The Common Agricultural Policy²⁷ was heavily criticized, partly for its lack of contribution towards achieving sustainable agriculture. There are important changes²⁸ due to take place. The most important of which are changes to the CAP. It is clear that there will be significant changes in the agri-environment programs. The concept of ecosystem services²⁹ has gained a strong political profile during the last 15 years. The ecosystem services concept is already embedded in recent EU (environmentally-related) policies.

Based on the statistical analysis, it was found that the selected characteristics of small farms varied significantly by region.

Conclusions

The spectrum of functions performed by farms, especially small farms, is abundant. These entities play an important role in shaping the quality of the environment. The increase in the number of small entities according to the analyzed economic criterion, one of the most important in the EU, in each of the separated regions of Poland confirms the need to analyze them in a regional system. On the basis of the conducted research, it can be concluded that in the group of small farms, there is a regional differentiation in their provision of environmental benefits. It should be remembered that small farms have greater possibilities to react to changes occurring in the agricultural market. There is a need for knowledge transfer in terms of public goods and the need to create a specific stream of financial support for these units to realize their potential in providing environmental benefits.

References

- Baum R., Śleszyński J.: Nowe funkcje rolnictwa – dostarczanie dóbr publicznych, *Zeszyty Naukowe Stowarzyszenia Rolnictwa i Agrobiznesu* 11, 2/2020, p. 19-23.
- Biernat-Jarka A.: Dobra publiczne w rolnictwie w nowej perspektywie finansowej Unii Europejskiej, *Zagadnienia Ekonomiki Rolnej*, 1 (346)/2016, p. 144-154.
- Bouwma I., Schleyer C., Primmer E., Winkler K.J., Berry P., Yang Y., Carmen E., Špulerová J., Bezák P., Preda E., Vadineanu A.: Adoption of the ecosystem services concept in EU policies, *Ecosystem Services*, 29/2018, p. 213-222.
- Czekaj M., Szafrńska M., Żmija K., Satoła Ł., Płonka A., Żmija D., Tyran E., Puchała J.: Rola małych gospodarstw rolnych. Diagnoza i perspektywy na przyszłość na przykładzie Podregionu Rzeszowskiego, Difin, Warszawa 2020.
- Duer I.: Dobra publiczne użytkowane i dostarczane przez rolnictwo – wspierane w ramach programu rozwoju obszarów wiejskich, *Studia i raporty IUNG-PIB*, 21/2010, p. 85-96.
- Gałązka A., Smreczak B.: Jakość gleb użytkowanych rolniczo i wskaźniki jej oceny, *Studia i raporty IUNG-PIB*, 54, 8/2017, p. 7.

²⁶ K. Sepp: Landscape Functions and Ecosystem Services, *Rural Development and Land Use*, 3 (2)/2012, p. 42.

²⁷ I. Antonopoulos: Public money for public goods and property rights, [in:] I. Antonopoulos, M. Bell, A. Cavoški, L. Petetin (eds), *The Governance in Agriculture in Post – Brexit UK*, Routledge, London 2022, p. 67.

²⁸ J. Jones, P. Silcock, T. Uetake: Public goods and externalities: agri-environmental policy measures in the United Kingdom, *OECD Food, Agriculture and Fisheries Paper*, 83/2015, p. 25.

²⁹ I. Bouwma, C. Schleyer, E. Primmer, K.J. Winkler, P. Berry, Y. Yang, E. Carmen, J. Špulerová, P. Bezák, E. Preda, A. Vadineanu: Adoption of the ecosystem services concept in EU policies, *Ecosystem Services*, 29/2018, p. 213.

- Ginter A.: Małe gospodarstwa rolne wobec wyzwań zrównoważonego rozwoju i Zielonego Ładu, Uniwersytet Przyrodniczo-Humanistyczny w Siedlcach, Siedlce 2021, p. 7.
- Glura J.: Wielofunkcyjne leśnictwo jako element dobrobytu człowieka, [in:] K.Kanenberg, H.Szramka (eds), Zarządzanie ochroną przyrody w lasach, Wyższa Szkoła Zarządzania w Tucholi, Tuchola 2007, p. 134-140.
- Grzelak A.: Akumulacja majątku w gospodarstwach rolnych w Polsce ze względu na typy produkcyjne i kontekst paradygmatu rozwoju zrównoważonego, *Zagadnienie Ekonomiki Rolnej*, 360, 3/2019, p. 89.
- Jaworowicz-Rudolf A.: Środowisko jako dobro chronione, [in:] Z. Duniewska (ed.), *Dobra chronione w prawie administracyjnym*, Uniwersytet Łódzki, Łódź 2014, p. 169-178.
- Jones J., Silcock P., Uetake T.: Public goods and externalities: agri-environmental policy measures in the United Kingdom, OECD Food, Agriculture and Fisheries Paper, Paris 2015.
- Louhichi K., Ciaian P., Espinose M., Perni A., Gomez y Paloma S.: Economic impacts of CAP greening: application of an EU-wide individual farm model for CAP analysis (IFM-CAP), *European Review of Agricultural Economics* 45 (2)/2018, p. 205-238.
- Machoń M.: Gospodarka leśna w obliczu potrzeb ochrony przyrody, *Roczniki Administracji i Prawa*, 13/2013, p. 155-171.
- Maciejczak M.: Rolnictwo i obszary wiejskie źródłem dóbr publicznych – przegląd literatury, *Zeszyty Naukowe SGGW w Warszawie. Ekonomia i Organizacja Gospodarki Żywnościowej*, 75/2009, p. 121-134.
- Melece L., Shena I.: Valuation of public goods and ecosystems services providing by agriculture. *Engineering For Rural Development 2018*. Conference paper: Proceeding 17th International Scientific Conference Engineering for Rural Development, Jelgava, 23-25.05.2018.
- Nowak D., Bilski Z., Kajdan-Zysnarska I.: Metody wpływające na poprawę żyzności gleby, *Centrum Doradztwa Rolniczego w Brwinowie, Oddział Poznań, Poznań 2019*.
- Olejniczak B., Maciantowicz M.: Zagrożenia biotyczne i abiotyczne na terenie Leśnego Kompleksu „Bory Lubuskie” i podejmowane działania zapobiegawcze, *Inżynieria Środowiska*, 13/2007, p. 326-332.
- Pannell D., Roberts A.: Public goods and externalities: Agri-environmental policy measures in Australia, OECD Food, Agriculture and Fisheries Papers No 80, OECD Publishing, Paris 2015.
- Salek L., Sivacioglu A.: Forests for future – multifunctional forests, *International Journal of Plant and Soil Science*, 24 (6)/2018, p. 1-9.
- Sazońska B.: Zasady prowadzenia gospodarstw w systemie rolnictwa ekologicznego, Wydawnictwo Centrum Doradztwa Rolniczego w Brwinowie, Oddział w Radomiu, Radom 2020.
- Sepp K.: Landscape Functions and Ecosystem Services, *Rural Development and Land Use*, 3 (2)/2012, p. 39-51.
- Somasundaram E., Udhaya Nandhini D., Meyyappan M.: Organic crop production techniques, [in:] E. Somasundaram, D. Udhaya Nandhini, M. Meyyappan (eds), *Principles of organic farming*, CRC Press, London 2021, p. 252-270.
- Ustawa z dnia 27.04.2001 r. Prawo ochrony środowiska, Dz.U. 2001 nr 62, poz. 627.
- Vanni F: *Agriculture and Public Goods – The Role of Collective Action*, Springer Science+Business Media, Dordrecht 2014.
- Wigier M., Podstawka M.: Measurement of the effectiveness of public aid for farms in Poland, *Polityki Europejskie, Finanse i Marketing* 26 (75)/2021, p. 68-78.
- Wilkin J.: Dobra dostarczane przez rolnictwo w świetle teorii dóbr publicznych, [in:] J.Wilkin (ed.) *Wielofunkcyjność rolnictwa. Kierunki badań, podstawy metodologiczne i implikacje praktyczne*, IRWiR-PAN, Warszawa 2010, p. 43-53.
- Zaniewicz-Bajkowska A., Franczuk J., Rosa R., Kosterna E.: *Nawozy zielone na Mazowszu*, Wydawnictwo Urząd Marszałkowski Województwa Mazowieckiego w Warszawie, Warszawa 2012.

Dostarczanie korzyści środowiskowych przez małe gospodarstwa rolne w ujęciu regionalnym – wybrane problemy

Streszczenie

Zmieniający się model funkcjonowania rolnictwa niesie ze sobą nowe kierunki jego rozwoju, w tym nowych jego funkcji związanych z dostarczaniem korzyści środowiskowych. Ochrona środowiska stała się najważniejszym punktem odniesienia w kształtowaniu wszystkich polityk realizowanych przez Unię Europejską (UE), w tym Wspólnej Polityki Rolnej, a rolnicy jako główni jej beneficjenci powinni mieć to na uwadze. Decyzje producentów rolnych podejmowane w procesach produkcyjnych mają duże znaczenie dla środowiska. Celem pracy było ukazanie i analiza regionalnego zróżnicowania korzyści środowiskowych dostarczanych przez małe gospodarstwa rolne na przykładzie wybranych cech gospodarstw. Dane do analizy pozyskano z Systemu Zbierania i Wykorzystywania Danych Rachunkowych z Gospodarstw Rolnych (Polski FADN) z trzech lat, tj. 2017, 2018 i 2019. Na podstawie przeprowadzonej analizy porównawczej i statystycznej stwierdzono, że dostarczanie korzyści środowiskowych przez małe gospodarstwa rolne jest regionalnie zróżnicowane. Ochrona gleby i działania prośrodowiskowe są szczególnie podkreślane w nowych rozwiązaniach Wspólnej Polityki Rolnej na lata 2023-2027. Wymagać to będzie przede wszystkim transferu wiedzy na poziomie instytucjonalnego otoczenia rolnictwa (przede wszystkim o charakterze doradczym) nie tylko w skali kraju, ale i regionu.

Słowa kluczowe: ochrona środowiska, małe gospodarstwo rolne, region, zróżnicowanie

Kody JEL: Q12, Q18

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SOCIO-DEMOGRAPHIC FACTORS AND THE 'UNBANKING' OF POLISH SOCIETY

The aim of the study was to assess the degree of advancement of non-cash trade among Polish residents/consumers and to determine the relationship between socio-demographic factors and Poles' 'unbankedness'. The assessment of the degree of advancement of the society's non-cash turnover was made by means of three levels of 'unbanking' defined by the author of the study. On the basis of the literature review, a research hypothesis was formulated: there is a statistically significant relationship between socio-demographic characteristics and consumers' unbankedness.

The research hypothesis was verified based on the results of our research using a survey questionnaire conducted in October/November 2019 on a sample of 500 adult Poles (18 years and older). The results of the empirical study generally confirmed the statistically significant influence of socio-demographic characteristics on the level of Polish people's unbankedness. Age, education level, net income per capita, and type of work performed 'significantly impact the Polish population's banking level. Variables such as gender and place of residence were found to be statistically insignificant. The study showed that 10% of the surveyed population were unbanked, while as many as 87.20% represented level 3 (full banking). The problem of transactional exclusion affects young people aged 18-24 and older people over 61. The unbanked group consisted mainly of farmers, unskilled workers, the unemployed and pensioners, while level 3 mainly included office workers, white-collar workers and skilled workers. The least exclusion is found in people of working age 25-44. People in this age bracket accounted for more than 40 per cent of the share within level 3. As educational attainment increases, people move to higher and higher levels in terms of 'bankedness'. The research showed that the higher the net income per person, the higher the level of bankedness among Poles. The results of the study complement previous analyses and point to proposed actions for institutions promoting non-cash transactions in Polish society.

Keywords: unbanking, non-cash payments, socio-demographic factors

JEL codes: D10, G11, R20

Introduction

The banking services market is systematically changing, which results from the growing competition in the sector, as well as from changes in the expectations and needs of consumers. The development of the banking sector requires the constant growth of customers, which – in turn – forces an increase in the level of banking in society. The low degree of banking is a severe problem as it means less use of non-cash payment instruments. This problem is important from the economic and social point of view and is increasingly explored by many fields of science, including due to its negative effects from the view of sustainable development. At the same time, many international institutions, such as the European Commission and the European Central Bank (ECB), treat financial inclusion as one of the methods of fighting poverty. The results of the work of the European Commission proved that the phenomenon of financial exclusion contributes to so-called "social exclusion", preventing the affected individuals from functioning normally in society. The negative effect of financial exclusion is also the restriction of the consumer rights of people affected by this problem. A lack of access to typical banking services results in higher

costs and greater risk concerning cash management. In addition, research has shown that financial exclusion has an inhibitory effect on the economic development of the country and the accumulation of human and physical capital¹.

The study aims to assess the degree of advancement of non-cash transactions in Polish society using the banking index, as well as to determine the relationship between socio-demographic factors and the banking economy of Poles. The formulated research hypothesis is there is a statistically significant relationship between socio-demographic characteristics and consumer banking.

The work consists of two main parts. The first part presents a review of the literature on the determinants of social banking, while the second part presents the results of the research: society was divided in terms of banking, and the share of people representing a given level was characterized. A χ^2 test was used to determine the relationship between socio-demographic factors and the banking-up of Poles, and the Cramer V coefficient was used to evaluate the strength of this influence. The work is completed with conclusions that can be drawn based on this study and recommendations.

Assessment of banking in Polish society

The basic measure of banking is the indicator illustrating the percentage of adults using a bank account (narrow approach)². Savings and checking account (ROR), the so-called “personal account” in which you can store savings or make transactions, is the basis for using non-cash payment instruments³. It enables the accumulation of funds and their disposal. Not having a bank account results in lower use of financial instruments such as cards, transfer orders, or direct debits. The activities of banks in the field of maintaining bank accounts are defined in Chapters 3 and 4 of the Banking (Banking)⁴ Act and in Art. 725 of the Civil Code⁵, according to which, by the bank account agreement, the bank undertakes (towards the account holder), for a specified or indefinite period of time, to store their funds and, if the agreement so provides, to conduct cash settlements at their request. A bank account may only be kept by banking institutions (i.e., banks and credit institutions), as well as Spółdzielcze Kasy Oszczędnościowo-Kredytowe – SKOK (Savings and Credit Union).

Although the issue of banking concerns many aspects of the economy, we will not find much research in this field in Polish literature. The most popular and authoritative research related to this subject, entitled Attitudes of Poles towards non-cash transactions, was conducted by D. Maison at the request of the National Bank of Poland in 2009, 2013, and 2016⁶. In the research conducted at that time, six levels (from 0 to 5) were distinguished in the form of a “funnel” indicator. Level 0 meant no cashless turnover, while level 5 corresponded to the highest level of advancement of cashless turnover. Research

¹ T. Beck, A. Demirgüç-Kunt: Access to Finance – An Unfinished Agenda, *The World Bank Economic Review*, 2008, p. 384.

²In the present case, there was no procedure for dealing with meshes (E. Stola: Ubankowienie społeczeństwa a rozwój sektora bankowego w Polsce, *Rozprawy Ubezpieczeniowe. Konsument na rynku usług finansowych*, 30, 4/2018, p. 83.

³ Z. Krzyżkiewicz: Operacje bankowe, [in:] W.L. Jaworski, Z. Zawadzka (eds), *Bankowość. Podręcznik akademicki*, Poltext, Warszawa 2008.

⁴ Ustawa z dn. 29 sierpnia 1997 r. Prawo bankowe, Dz.U. z 1997 r., Nr 140, poz. 939 as amend.

⁵ Ustawa z dnia 23 kwietnia 1964 r. Kodeks cywilny, Dz.U. z 1964 r., Nr 16, poz. 93 as amend.

⁶ D. Maison: Postawy Polaków wobec obrotu bezgotówkowego. Raport z badania 2016 i analiza porównawcza z danymi z 2009 i 2013 roku, Narodowy Bank Polski, Warszawa 2017.

by D. Maison showed that, in 2016, the percentage of people with banking services was 83%. Another important study was developed by T. Koźliński in May 2013, entitled “Payment habits of Poles”⁷. Koźliński distinguished four levels, where level 0 meant no bank account, and level 4 concerned people who had a payment card and made payments six times a month or more often⁸. The survey showed that in 2012, 77% of adult Poles had a bank account. His studies in this area from 2006 and 2012 indicate that between these years, the percentage of people with a personal account increased quite significantly in all population groups due to the place of residence, and the largest increase in the percentage of people having a personal account took place in rural areas. However, in 2012, the percentage of people without a bank account was still the highest in rural areas (28%).

To assess the advancement of non-cash transactions among the inhabitants of Poland, this study divided the sample into categories based on those proposed by the European Commission representing a given level of banking⁹. Three levels of consumer banking were distinguished: unbanked, marginally banked, fully banked, which – apart from having a bank account – also considered the intensity of using payment services. Below, three categories representing a given level of banking (in a broader sense) are characterized, modifying them for the purposes of the author’s research, their meaning:

1. Level 1 – unbanked – these are people who do not have a bank account (i.e., a personal account – as defined by the European Commission);
2. Level 2 – marginally banked – these are people who have a bank account and do not have a payment card (as defined by the European Commission); according to the author’s definition, these are people who, in the survey, indicated that they have a bank account but do not have a payment card, and those who declared that they had a payment card but did not use it. Anderloni and Carluccio define these people as insufficiently banked, where – in their understanding – they are people who have a bank account but do not take advantage of the many opportunities it offers¹⁰;
3. Level 3 – fully banked – people who have access to a wide range of transactional banking, who actively use electronic banking services according to their needs and socio-economic status (as defined by the European Commission); according to the author’s definition, these are people who have a bank account and a payment card, and actively use it.

Banking determinants in the light of literature

NBP research shows that the use of non-cash forms of payment depends on factors such as age, education, household income, place of residence, employment status or type of profession. In addition to domestic studies, other international studies (including Connolly

⁷ T. Koźliński: *Zwyczajne płatnicze Polaków*, Narodowy Bank Polski, Departament Systemu Płatniczego, Warszawa 2013, p. 10.

⁸ *Ibidem*, p. 245.

⁹ *Financial Services Provision and Prevention of Financial Exclusion*, European Commission, p. 15, <https://www.fi-compass.eu/sites/default/files/publications/financial-services-provision-and-prevention-of-financial-exclusion.pdf> (access: 15.04.2020).

¹⁰ L. Anderloni, E.M. Carluccio: *Access to Bank Account and Payment Services*, [in:]: L. Anderloni, M.D. Braga, E. Carluccio (eds.), *New Frontiers in Banking Services. Emerging Needs and Tailored Products for Untapped Markets*, Springer-Verlag, Berlin, Heidelberg 2007.

and Hajjaj¹¹, the European Commission¹², Fondeville et al.¹³) indicate the existence of such dependencies. Conclusions from studies by other authors regarding the impact of socio-demographic features on non-banking are presented in Table 1.

Table 1. Determinants of banking - the most important conclusions from the research

Author	Conclusions from the research
N. Jonker (2007) ¹⁴ ; R.W. Meijer (2001) ¹⁵	<ul style="list-style-type: none"> • young people aged 25-34 more often choose non-cash payment methods • age is a key factor in determining the form of payment • women, more often than men, use non-cash forms of payment because they visit different places, make purchases more often, hence the greater probability that they will encounter a terminal or a customer service point (POS)
J. Stavins (2001) ¹⁶	<ul style="list-style-type: none"> • there is a negative correlation between age and the use of cash to make payments, and a positive correlation between the use of a credit card and age, as well as income and education level
D. Humphrey, M. Kim, B. Vale (2001) ¹⁷ ; E. Klee (2004) ¹⁸ ; H. Allen (2003) ¹⁹	<ul style="list-style-type: none"> • a key factor determining non-cash payments are the costs borne by customers when making payments, the speed of transactions, ease of use, or loyalty programs related to payment instruments
S. Schuh, J. Stavins (2007) ²⁰	<ul style="list-style-type: none"> • cost, convenience, and security are more important factors in choosing a payment method than demographic characteristics and other observable variables
F. Hayashi, E. Klee (2003) ²¹	<ul style="list-style-type: none"> • the choice of a given payment instrument depends on the willingness of consumers to accept modern technologies, as well as the nature of the transaction – the value and frequency of transactions and the physical characteristics of the point of sale of a good or service, • consumers who used computers were more likely to use a debit card or make payments via an electronic account
C. Gan, M. Clemens, V. Limsombunchai, A. Weng (2006) ²²	<ul style="list-style-type: none"> • gender does not have a statistically significant influence on the willingness to use electronic banking

¹¹ C. Connolly, K. Hajjaj: Financial Services and Social Exclusion. Financial Services Consumer Policy Centre, University of New South Wales, Sydney 2001.

¹² Financial Services Provision and Prevention of Financial Exclusion, EC Report VC/2006/0183, European Commission, Brussels 2008.

¹³ N. Fondeville, E. Özdemir, T. Ward: Financial Exclusion in the EU. New Evidence from the EU-SILC Special Module. Research Note 3, European Commission, Brussels 2010.

¹⁴ N. Jonker: Payment instruments as perceived by consumers: results from a household survey, *De Economist*, 155, 3/2007, p. 271-303.

¹⁵ W. Meijer: The Single European Cash Area: Towards a more efficient European cash society, *Journal of Payments Strategy & Systems*, 4, 3/2010, p. 1-9.

¹⁶ J. Stavins: Effect of Consumer Characteristics on the Use of Payment Instruments, *New England Economic Review*, 3/2001, p. 19-31.

¹⁷ D. Humphrey, M. Kim, B. Vale: Realizing the Gains from Electronic Payments: Costs, Pricing and Payment Choice, *Journal of Money, Credit and Banking* 33, 2/3/2001, p. 216-234.

¹⁸ E. Klee: Retail payments 1995-2001: findings from aggregate data and the survey of consumer finances, Board of Governors of the Federal Reserve System, Washington 2004.

¹⁹ A. Allen: Innovations in retail payments: e-payments, *Quarterly Bulletin*, Bank of England 2003, p. 428-438.

²⁰ S. Schuh, J. Stavins: Why Are (Some) Consumers (Finally) Writing Fewer Checks? The Role of Payment Characteristics, Federal Reserve Bank of Boston, Boston 2007, p. 1-37.

²¹ F. Hayashi, E. Klee: Technology Adoption and Consumer Payments: Evidence from Survey Data, *Review of Network Economics*, 2 (2)/2003, p. 175-190.

²² C. Gan, M. Clemens, V. Limsombunchai, A. Weng: A logit analysis of electronic banking in New Zealand, *International Journal of Bank Marketing*, 24 (6)/2006, p. 360-383.

cont. Table 1

D. Saiti, M. Kiselick, S. Josimovski (2015) ²³	<ul style="list-style-type: none"> the use of payment cards, including credit cards, increases with age, the use of online banking services decreases, and satisfaction with electronic payments increases
A. B. Kennickell, M. L. Kwast, 1995 ²⁴	<ul style="list-style-type: none"> a higher level of education and owned financial assets increase the likelihood of electronic payments
R. Borzekowski i E. K. Kiser ²⁵ (1997)	<ul style="list-style-type: none"> women are much more inclined to use a wider range of available electronic payment methods than men
R. Boer ²⁶ (2010)	<ul style="list-style-type: none"> the security and cost of using a given payment instrument are negatively correlated with each other

Source: own study based on literature review.

As shown in Table 1, on the one hand, banking is influenced by socio-demographic factors; on the other, it is influenced by features resulting from the instruments of non-cash transactions such as speed, convenience, security, and related loyalty programs. Moreover, the research results are not conclusive; hence there is a justification to continue research in this area. In addition, it should be emphasized that the analyses so far focused on all respondents participating in the study, not considering the degree of advancement of non-cash transactions. Also, they mainly concerned the scale of use of non-cash payment instruments and the scope of their use depending on the amount and place of payment. This study aims to identify the determinants of the use of non-cash forms of payment depending on the socio-demographic features of the respondents and the features of payment instruments in three groups of respondents, distinguished due to the defined indicator of inclusion of banking.

Research methodology

The foundation for the inference was an empirical study based on the results of a survey conducted at the turn of October and November 2019 on a group of 500 adult Poles (18 years and older). The selection of respondents was random. A random selection of the place of implementation and the quota selection of respondents was used considering the basic demographic variables.

Based on the results of the questionnaire survey, the relationship between the qualitative characteristics will be verified. The first step in measuring the correlation dependence of two qualitative features is to build a contingency table (cross table) containing the counts of implementation of each variant of variables. The χ^2 measure determines the difference between the actual and theoretical counts in individual fields of the table.

²³ D. Saiti, M. Kiselick, S. Josimovski: Level of customer satisfaction from electronic banking services in the Polog region, *Journal of Sustainable Development*, 5 (13)/2015, p. 45-68.

²⁴ A.B. Kennickell, M.L. Kwast: Who uses electronic banking? Results from the 1995 Survey of Consumer Finances, *Proceedings from the Federal Reserve Bank of Chicago's Annual Conference on Bank Structure and Competition*, Federal Reserve Bank of Chicago, Chicago 1997, p. 1-48.

²⁵ R. Borzekowski, E.K. Kiser: *The Choice at the Checkout: Quantifying Demand Across Payment Instruments*, Finance and Economics Discussion Series Divisions of Research & Statistics and Monetary Affairs Federal Reserve Board, Washington, DC 2006, p. 1-34.

²⁶ R. Boer, C. Hansen, A. Srepcnic: *Online Payments 2010. Increasingly a Global Game*, "Innopay", Amsterdam 2010, p. 99.

$$\chi^2 = \sum_{i=1}^k \sum_{j=1}^l \frac{(n_{ij} - \hat{n}_{ij})^2}{\hat{n}_{ij}}$$

where: n_{ij} – empirical number, \hat{n}_{ij} – theoretical number, k – number of variants of the variable X , l – number of variants of the variable Y .

The values of the χ^2 measure other than 0 indicate the existence of a relationship between the variables. However, it is not possible to state how strong the analyzed relationship is. This measure has no upper range. The χ^2 value depends on the size of the community. Along with the increase in the number of examined units, the measure's value also increases, making it impossible to compare the strength of dependencies occurring in diverse groups. Due to the indicated two drawbacks of the measure, in practice, measures are used that have normalized values in the range of 0.1 and are resistant to changes in the size of the studied population²⁷.

Evaluating the significance of the determined χ^2 statistics is based on the verification of the truth of the hypothesis assuming no relationship between the variables, against the hypothesis of the existence of dependence. The χ^2 test statistic is compared with the critical values read from the χ^2 distribution tables for a given significance level (0.05) and degrees of freedom $df = (k-1)(l-1)$.

Cramer's V-coefficient will be used to evaluate the strength of the relationship between qualitative (non-measurable) features. Cramer's V coefficient is a measure based on the χ^2 statistic. It is standardized in the interval [0.1] and resistant to both the size of the studied sample and the inequality in the number of variants of the studied variables:

$$V = \sqrt{\frac{\chi^2}{(m-1)N}}$$

where: m – number of columns or rows, depending on which value is smaller, N – the size of the studied population.

The coefficient values allow for inference only about the strength of the correlation, but the direction of the relationship cannot be determined on their basis. The statistical significance was assessed based on the empirical significance level generated in the SPSS program. A statistically significant relationship between the variables was evidenced by the values of the empirical significance level lower than 0.05²⁸.

The research results

The selected sample was representative in terms of gender, age, education, place of residence, and income. 51.20% of women and 48.80% of men participated in the study. The respondents aged 45-60 and 61 years and older accounted for 25.20 and 27.40% of the sample, respectively. In the surveyed population, the share of people with secondary education (including post-secondary) was 31.20, and 5% with primary education. Most of the

²⁷ J. Suhecka: *Metody statystyczne. Zarys teorii i zadania*, Wydawnictwo Wydziału Zarządzania Politechniki Częstochowskiej, Częstochowa 2003, p. 60.

²⁸ M. Nawojczyk: *Przewodnik po statystyce dla socjologów*, Wydawnictwo Predictive Solutions, SPSS, Kraków 2010, p. 175.

respondents lived in the country (39.80%). Every third respondent declared that his monthly net income ranged between PLN 1,801-2,500. Extreme amounts of income per person (i.e., PLN 900 or less and over PLN 5,000) were declared by 6.4 and 4.8% of the respondents, respectively. The main source of income in the surveyed group of respondents was white-collar, office, and skilled workers.

First, the degree of banking was assessed among adult Poles (over 18 years of age) in accordance with the selected categories of banking defined in the first part of this study. The figure below shows the share of respondents in each group in terms of banking.

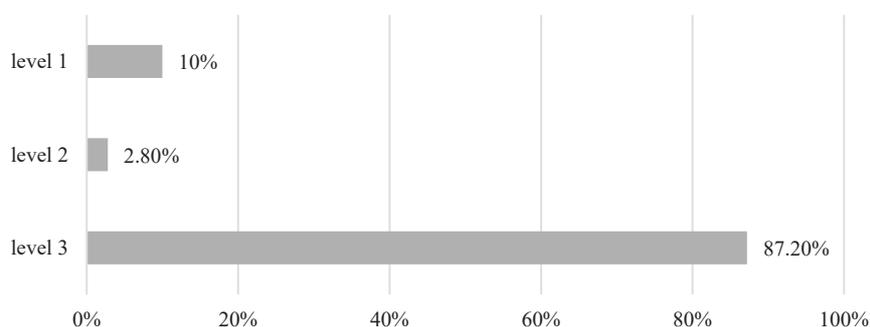


Figure 1. The level of banking in Polish society
Source: own study based on survey results ($N = 500$ people).

As can be seen from the data presented in Figure 1, the share of individual groups representing a given level of banking varies. Level 1 reflects the lowest level of use of non-cash transactions (the so-called “group of unbanked people”), which constituted 10% of the respondents. It was represented by people who did not have a bank account. A bank account is the basis for the use of non-cash payment instruments. Low levels of banking result in lower use of financial services such as cards, transfers, or direct debits. Comparing the results of the research with the results of the National Bank of Poland, it can be concluded that level 1 (in this study) is equivalent to the zero level in the funnel indicator of prof. D. Maison. In 2009, there were 22% of such people, 13% in 2013, and 17% in 2016²⁹. In turn, the research of T. Koźliński shows that 23% of respondents in 2012 did not have a bank account³⁰. It can, therefore, be concluded that the group of unbanked people is systematically decreasing, which should be assessed positively. As the results of the research show, in the group of people representing the zero level, there are mainly respondents aged 61 and more (52% of the group of people without an account). Similar tendencies were observed by T. Koźliński in his research already in 2009³¹. The group of unbanked people included respondents with vocational (42%), secondary (28%) and incomplete primary and primary education (22%), living in villages (50%), with an income between PLN 901 and PLN 1,800 (56%), farmers (20%), and retirees and pensioners (24%). People who did not have a bank account most often indicated that they did not see the need to have one (34.78% of responses from the group of people who declared that

²⁹ D. Maison: Postawy Polaków wobec obrotu bezgotówkowego..., 2017, *op. cit.*, p. 11.

³⁰ T. Koźliński: Zwyczaje płatnicze..., 2013, *op. cit.*, p. 10.

³¹ T. Koźliński: Porównanie wyników badań ubankowienia Polaków przeprowadzonych przez NBP w 2006 i 2009 r., NBP, Warszawa 2009, p. 5.

they did not have an account), and 23.19% of respondents indicated that they do not trust banks. In addition, 14.49% of respondents indicated that someone from their family has an account and can use it, and for 11.59% of respondents from level 1, bank charges are too high. For 88% of respondents in this group, having a bank account is not a way to save money, and 78% believe that bank account holders quickly fall into the debt trap. According to 66% of respondents from this group, theft from bank accounts is commonplace.

In terms of banking, compared to other European Union countries, in 2017, Poland was in 20th position, while in 2011, it was in 26th position (see Table 2).

Table 2. Percentage of bank account holders among persons aged 15 and over in EU countries in 2011, 2014, and 2017

Country	2011	2014	2017
Denmark	99.70	100.00	99.90
Finland	99.70	100.00	99.80
Sweden	99.00	99.70	99.70
the Netherlands	98.70	99.30	99.60
Germany	98.10	98.80	99.10
Luxembourg	94.60	96.20	98.80
Belgium	96.30	98.10	98.60
Austria	97.10	96.70	98.20
Estonia	96.80	97.70	98.00
Slovenia	97.10	97.20	97.50
Malta	95.30	96.30	97.40
United Kingdom	97.20	98.90	96.40
Ireland	93.90	94.70	95.30
France	97.00	96.60	94.00
Spain	93.30	97.60	93.80
Italy	71.00	87.30	93.80
Latvia	71.00	87.30	93.80
Portugal	81.20	87.40	92.30
Cyprus	85.20	90.20	88.70
Poland	70.20	77.90	86.70
Croatia	88.40	86.00	86.10
Greece	77.90	87.50	85.50
Slovakia	79.60	77.20	84.20
Lithuania	73.80	77.90	82.90
The Czech Republic	80.70	82.20	81.00
Hungary	72.70	72.30	74.90
Bulgaria	52.80	63.00	72.20
Romania	44.60	60.80	57.80

Source: own study based on the Report The Little Data Book on 18 Financial Inclusion, Global Index Database, World Bank Group, Washington 2018, <https://openknowledge.worldbank.org/bitstream/handle/10986/29654/LDB-FinInclusion2018.pdf?sequence=1&isAllowed=y> (access: 09.05.2020)

According to the World Bank's report "The Little Data Book on 18 Financial Inclusion"³², the percentage of bank account holders among Poles aged 15 or over increased in 2017 to 86.7%. In this age group, the highest percentage of bank account holders was recorded in Denmark, Finland, and Sweden; the lowest in Romania, Bulgaria, and Hungary. In terms

³² Report The Little Data Book on 18 Financial Inclusion, Global Index Database, World Bank Group, Washington 2018, <https://openknowledge.worldbank.org/bitstream/handle/10986/29654/LDB-FinInclusion2018.pdf?sequence=1&isAllowed=y> (access: 09.05.2020).

of the number of bank accounts in 2018, Poland ranked 9th among 20 European Union countries, with a bank account ratio of 2.0 per capita. It is worth noting that in 2018, the number of bank accounts per capita in Poland was 2.0 and increased the advantage over the average for the European Union and the Eurozone, which this year averages amounted to 1.7 accounts per capita. It is worth noting that the average number of bank accounts per capita in Poland has been constantly growing since 2006, while the trends for the EU averages do not always tend to increase. Compared to 2017, Poland moved up two positions in the ranking, ahead of Austria and Malta (whose data is not available)³³.

The survey showed that in 2019, 90% of adult Poles (i.e., 18 years of age and more) declared having a personal account, of which 72.89% in the group with banking services had one account, and the rest at least two personal accounts. The research allowed establishing that most respondents indicated that the main motive for opening a bank account was the requirement imposed by the employer, school, or university. In second place was a group of people who said they had not thought about what prompted them to open a bank account. 97 responses indicated that the main factor influencing the opening of the bank account was the credit taken. It is worth noting that 41.60% of the respondents claim that they would rather choose to open a bank account, and 26.8% would not hesitate to open an account if receiving a loan would depend on having an account. The remaining positions were taken by receiving the 500+ benefit and the influence of other people. Among other factors, the respondents indicated the requirement to have a bank account in connection with running a business

The group of people in banking was divided into two levels (the second and the third). Level 2 was represented by people with marginal banking facilities – such people were only 2.80% of the sample. The vast majority in this group were respondents who, however, had a payment card but did not use it. Interestingly, if they had a card, it was more often a credit card than a debit card. Unlike a debit card, a credit card also allows for non-cash transactions, although it is not tied to the current account³⁴. Level 2 respondents were not interested in making mobile payments (i.e., using the BLIK application or other mobile payments). The most frequent threat related to non-cash payments was the risk of theft (almost 60% of responses). For this group of respondents, the features of non-cash payments, such as security, convenience (you do not need to have cash with you), and the simplicity of making payments, were more often indicated than the cost resulting from the use of these instruments (e.g., card fee). The highest percentage of Level 2 respondents was in the 45-60 age group (42.90% of Level 2). It is also worth pointing out that 35.70% of this group were people aged 61 and more with basic vocational education (35.70%). As in the case of level 0, a lower interest in banking services among rural residents was also confirmed. Level 2 was represented by as many as 57.10% of the rural population. The distribution of net income per person in the household was in this group of respondents. The respondents in this group are farmers and skilled and unskilled workers. When asked what prompted them to open a bank account, 35.70% of responses indicated that it was a requirement of the employer, school, or university. For the marginally banked, key factors when choosing a personal account were the amount of the account maintenance fee, the amount of the fee for issuing a payment card, as well as access to the bank account via

³³ Porównanie wybranych elementów polskiego systemu płatniczego z systemami innych krajów Unii Europejskiej za 2018 r., NBP, Departament Systemu Płatniczego, Warszawa 2020, p. 8-9.

³⁴ W. Grzegorzcyk: Marketing bankowy, Oficyna Wydawnicza Branta, Bydgoszcz, Łódź 2004, p. 158.

the internet. 42.90% of respondents from level 2 believe that having an account makes it easy to fall into the debt trap.

Level 3 was represented by as much as 87.20% of the studied population. These were people who had at least one personal account and a payment (debit) card who actively used it. In addition, 22% of Level 3 respondents had a credit card and were actively using it. In this group of people, other types of cards – such as virtual or prepaid – were little known. It is worth noting that over 40% of respondents use a payment card to pay for purchases in stores (43.10%), and the same number declares that they withdraw or deposit cash from an ATM/CDM occasionally (i.e., up to twice a month). Shopping in hypermarkets, discount stores (such as Biedronka or Lidl) and chain stores (e.g., Żabka) is more often made without cash (about 60% of indications). In addition, 75.90% of respondents more often pay their bills online, and only less than 13% at the store's cash register. The smallest group representing level 3 in terms of banking services were young people aged 18-24 (9.20%), while the share of respondents in other age categories was similar. Over 31% of respondents from level 3 had secondary education. Interestingly, 37.80% of the respondents from this group were rural residents, which indicates that the place of residence is no longer a significant problem when it comes to the possibility of making non-cash payments. The respondents from the discussed level achieved an average monthly income per person in the range of PLN 1,801-PLN 2,500 (28.90%). The percentage of people with the lowest income from this level was only 5.30%. They were white-collar respondents (28.70%) and skilled workers (26.10%). 70.20% of the respondents from level 3 declared that they did not make payments using a mobile phone, and the rest stated that such payments are made very rarely. Only about 5% of the level uses this type of payment. When it comes to threats/inconveniences related to non-cash payments, the respondents indicated that they were technical problems in first place, and the risk of theft in second place. Contrary to level 2 respondents, the most key features related to non-cash payments were: the number of points accepting payments, the possibility of making payments without leaving home and the possibility of making transactions at any time than other advantages such as convenience, simplicity, and speed.

To verify the hypothesis formulated in the article, a χ^2 test of independence was carried out. The results of the analyses are presented in Table 3.

Table 3. Values of the relationship indicators between the payment inclusion index and selected socio-demographic variables deciding on the choice of non-cash payments (N = 450)

Independent variables	Value of the χ^2 test	Number of degrees of freedom (<i>df</i>)	Value <i>p</i>	Cramer's V coefficient	Rejection of the H ₀ hypothesis in favor of H ₁ (feature dependence)
Sex	1,873	2	0.392	0.065	No
Age	23,902	8	0.002	0.163	Yes
Education	71,818	10	0.000	0.282	Yes
Domicile	7,792	10	0.649	0.093	No
Net income per person in the household	37,324	12	0.000	0.204	Yes
Performed profession	102,019	20	0.000	0.337	Yes

* Bold type indicates independent variables statistically significant for $p < 0.05$

Source: own research using a questionnaire.

Based on the results of the survey, the relationship between the level of banking and age was first verified, where the following hypotheses were formulated for these variables:

H₀: Variable Banking Level and Age are independent;

H₁: Banking level and age variables are not independent;

$p < \alpha$ – H₀ should be rejected in favor of the alternative hypothesis $\alpha = 0.05$ (i.e., there is a relationship between the variables);

$p \geq \alpha$ – there are no grounds for rejecting H₀ (i.e., there is no relationship between the variables).

The value of the χ^2 test's statistic for the pair of variables and the level of banking and age was 23.902 ($df = 8$), and the determined p-value for it was 0.00. This means that there is a relationship between the studied variables at the significance level of $\alpha = 0.05$. The strength of this relationship is weak, as evidenced by the value of the Cramer V-coefficient = 0.163. This variable has been highlighted by, among others, N. Jonker³⁵. A significant relationship was also found between:

- the level of banking and education ($\chi^2 = 71.818$, $df = 10$, V-Cramer = 0.282);
- level of banking and income ($\chi^2 = 37.324$, $df = 12$, V-Cramer = 0.204);
- the level of banking and the occupation performed ($\chi^2 = 102.019$, $df = 20$, Cramer's V = 0.337).

The obtained research results indicate a lack of a statistical relationship between the level of banking and gender, as well as the level of banking and the place of residence. These results are in line with, among others, the findings of N. Jonker³⁶, E.S. Mot, J.S. Cramer, and E.M. Gulik³⁷, which confirm the lack of impact of the gender of payment instrument users on bankization.

The value of the V-Cramer coefficients based on the χ^2 test allows measuring the strength of the relationship between the examined features³⁸. It turns out that the strongest relationship was found between the level of banking and the type of occupation/occupation. The strong influence of this variable has also been noted by S. Schuh, J. Stavins³⁹; F. Hayashi, and E. Klee⁴⁰. Therefore, it can be concluded that the hypothesis posed in the following study has been positively verified: there is a statistically significant relationship between socio-demographic characteristics and consumer banking.

It should be stressed that external factors such as the current inflation crisis, the uncertainty of the war in Ukraine and the impact of shocks such as the COVID-19 pandemic are also impacting the unbanked population. The pandemic caused changes in consumer payment behavior, causing panic, fear and even loathing of the use of cash⁴¹. Studies by the central banks of Sweden and the Netherlands show that the pandemic increased the use of cashless payment methods, especially in the age groups that had previously been the most conservative⁴². At the start of the pandemic, there was a marked decline in cash

³⁵ N. Jonker: Payment instruments as perceived by consumers: results from a household..., 2007, *op. cit.*, p. 271-303.

³⁶ *Ibidem*.

³⁷ E.S. Mot, J.S. Cramer, van der E.M. Gulik: De keuze van een betaalmiddel, SEO rapport nr 228, Stichting voor Economisch Onderzoek der Universiteit van Amsterdam, Amsterdam 1989, p. 99.

³⁸ M. Łapczyński: Analiza porównawcza tabeli kontyngencji i metody CHAID, *Zeszyty Naukowe, Akademii Ekonomicznej w Krakowie*, 659/2005, p. 151.

³⁹ S. Schuh, J. Stavins: Why are (some)..., 2007, *op. cit.*, p. 5.

⁴⁰ F. Hayashi, E. Klee: Technology adoption..., 2003, *op. cit.*, p. 175-190.

⁴¹ C. Galoni, G.S. Carpenter, H. Rao: Disgusted and afraid: Consumer choices under the threat of contagious disease, *Journal of Consumer Research*, 3, 47/2020, p. 373-392.

⁴² Payments in Sweden 2020, Sveriges Riksbank, 2020, <https://www.riksbank.se/en-gb/payments--cash/payments-in-sweden/payments-in-sweden-2020/1.-the-payment-market-is-being-digitalised/>, (access: 10.12.2021); Contactless payments gaining further ground during the COVID-19 crisis, DNB (De Nederlandsche Bank),

use among those aged 12-34 and 65 and over. An international UN study⁴³ and research conducted in Poland⁴⁴ shows that during the pandemic, consumers were significantly more likely to make large online purchases than at physical retail outlets, accompanied by an increase in the average transaction amount. The substitution of trade in physical retail outlets (PHUs) by online trade during the pandemic was also recognized by D. Bounie, Y. Camara, and J.W. Galbraith⁴⁵.

The change in payment trends is also reported in the Bank for International Settlements (BIS) annual economic report of June 2020. The report indicates that the COVID-19 pandemic has had a major impact on retail payments – in particular, the increase in contactless payments and e-commerce, and the decrease in cross-border transactions and migrants' remittances due to their vulnerability in the face of job loss and uncertainty⁴⁶. The Bank for International Settlements (BIS) report of August 2020 is also noteworthy⁴⁷. According to the BIS, 2020 was a landmark year for the implementation of central bank digital currencies (CBDCs).

Conclusions

The study showed that socio-demographic factors significantly differentiate the level of use of banking services in Poland. Age, level of education, net income per person, and type of work have a significant impact on the banking of the Polish society. Variables such as gender and place of residence turned out to be statistically insignificant. Women and men use non-cash payments to a similar extent; hence gender turned out to be a less significant factor when it comes to financial behavior. The place of residence seems to be less important when it comes to banking, as the difference in the percentage of residents of rural areas (37.80%) and large cities (over 101,000 inhabitants) (28.70%) was moderate. A particularly interesting relationship occurs between the level of banking and the age of the respondents. The problem of transactional exclusion concerns mainly the elderly over 61 (52%). The smallest exclusion occurs in people of working age 25-44. People from this age group accounted for over 40% of the share in level 3. With the increase in the level of education, people are shifted to higher and higher levels in terms of banking. For example, the percentage of people with primary and incomplete primary education at level 1 was around 22%, while only 2% with higher education. People with higher education matched mainly level 3 in terms of banking (23.90%). The higher the net income per person, the higher the level of banking among Poles. People with low income (i.e., in the range of PLN 901-PLN 1800) constituted as much as 56% of the respondents of work performed. The group of unbanked groups included mainly farmers (20%), unskilled workers (10%),

DNBulletin, 2020, <https://www.dnb.nl/en/news/news-and-archive/dnbulletin-2020/dnb389694.jsp> (access: 10.12.2021).

⁴³ COVID-19 Has Changed Online Shopping Forever, Survey Shows, UNCTAD, 2020, <https://unctad.org/press-material/covid-19-has-changed-online-shopping-forever-survey-shows> (access: 26.02.2021).

⁴⁴ R. Kotkowski (red.), M. Dulnicz, K. Maciejewski: Zwyczaje płatnicze w Polsce w 2020 r. Podstawowe wyniki badania, NBP, Warszawa 2021, p. 24.

⁴⁵ D. Bounie, Y. Camara, J.W. Galbraith: Consumers' mobility, expenditure and online-offline substitution response to COVID-19: evidence from French transaction Data, CIRANO Working Papers, 2020, p. 2020S-2028S.

⁴⁶ Annual Economic Report, Bank for International Settlements (BIS), 2020, p. 76, <https://www.bis.org/publ/arpdf/ar2020e.pdf> (access: 26.06.2022).

⁴⁷ R. Auer, G. Cornelli, J. Frost: Rise of the central bank digital currencies: drivers, approaches and technologies, BIS Working Papers, 880/2020, p. 1-42.

the unemployed (14%), and retirees and pensioners (24%), while under level 3, mainly clerical and white-collar workers (28.70%) and skilled workers (26.10%).

Since 10% of the surveyed population are unbanked (level 1) people with low incomes and simultaneously declare that the prices of banking services (fees for transfers, for a card) are important to them, banks should come up with attractive prices for them by offering more flexible banking products (e.g., prepaid cards tailored to the needs of consumers, which would contribute to benefits for both parties and to the development of cashless transactions).

It is also worth paying attention to the fact that a crucial factor determining the use of non-cash payments is the level of financial knowledge. 20% of the respondents from level 1 indicated in third place that the main unworthiness related to non-cash forms of payment is the lack of sufficient knowledge about them. Hence, a group of these people should be included in all initiatives and educational activities promoting non-cash transactions. In addition, the educational campaign would convince unbanked people who currently do not see the need for a personal account or have too low an income.

Given the development of the Polish payment system, uncertainty and fear related to the war in Ukraine, and high inflation, it is advisable to continue research in monitoring the dynamics and directions of changes in consumer behavior. Such research may prove to be a valuable source of information for institutions supporting the development of cashless transactions in Poland.

References

- Allen H.: Innovations in retail payments: e-payments, Quarterly Bulletin, Bank of England 2003, p. 428-438
- Anderloni L., Carluccio E.M.: Access to Bank Account and Payment Services, [in:]: L. Anderloni, M.D. Braga, E. Carluccio (eds.), *New Frontiers in Banking Services. Emerging Needs and Tailored Products for Untapped Markets*, Springer-Verlag, Berlin, Heidelberg 2007.
- Annual Economic Report, Bank for International Settlements (BIS), 2020, <https://www.bis.org/publ/arpdf/ar2020e.pdf> (access: 25.10.2020).
- Auer A., Cornelli G., Frost J.: Rise of the central bank digital currencies: drivers, approaches and technologies, BIS Working Papers, 880/2020, p. 1-42.
- Beck T., Demirgüç-Kunt A.: Access to Finance – An Unfinished Agenda, *The World Bank Economic Review*, 2008, p. 383-396.
- Boer R., Hansen C., Sreepnic A.: *Online Payments 2010. Increasingly a Global Game "Innoplay"*, Amsterdam 2010.
- Borzekowski R., Kiser E.K.: *The Choice at the Checkout: Quantifying Demand Across Payment Instruments*, Finance and Economics Discussion Series Divisions of Research & Statistics and Monetary Affairs Federal Reserve Board, Washington, DC 2006.
- Bounie D., Camara Y., Galbraith J.W.: Consumers' mobility, expenditure and online-offline substitution response to COVID-19: evidence from French transaction Data, CIRANO Working Papers, 2020, p. 2020S-2028S.
- Cannolly C., Haijai K.: *Financial Services and Social Exclusion*. Financial Services Consumer Policy Centre, University of New South, Sydney 2001.
- COVID-19 Has Changed Online Shopping Forever, Survey Shows, UNCTAD, 2020, <https://unctad.org/press-material/covid-19-has-changed-online-shopping-forever-survey-shows> (access: 26.02.2021).
- Financial Services Provision and Prevention of Financial Exclusion, European Commission, <https://www.fi-compass.eu/sites/default/files/publications/financial-services-provision-and-prevention-of-financial-exclusion.pdf> (access: 15.04.2020).

- Financial Services Provision and Prevention of Financial Exclusion. EC Report, VC/2006/0183, European Commission, Brussels 2008.
- Fondeville N., Özdemir E., Ward T.: Financial Exclusion in the EU. New Evidence from the EU-SILC Special Module. Research Note 3. European Commission, Brussels 2010.
- Galoni C., Carpenter G.S., Rao H.: Disgusted and afraid: Consumer choices under the threat of contagious disease, *Journal of Consumer Research*, 3, 47/2020, p. 373-392.
- Gan C., Clemens M., Limsombunchai V., Weng A.: A logit analysis of electronic banking in New Zealand, *International Journal of Bank Marketing*, 24 (6)/2006, p. 360-383.
- Grzegorzczak W.: Marketing bankowy, Oficyna Wydawnicza Brant, Bydgoszcz, Łódź 2004.
- Hayashi F., Klee E.: Technology Adoption and Consumer Payments: Evidence from Survey Data, *Review of Network Economics*, 2 (2)/2003, p. 175-190.
- Humphrey D., Kim M., Vale B.: Realizing the Gains from Electronic Payments: Costs, Pricing and Payment Choice, *Journal of Money, Credit and Banking* 33, 2/3/2001, p. 216-234.
- Jonker N.: Payment instruments as perceived by consumers: results from a household survey, *De Economist*, 155, 3/2007, p. 271-303.
- Kennickell A.B., Kwast M.L.: Who uses electronic banking? Results from the 1995 Survey of Consumer Finances, Proceedings from the Federal Reserve Bank of Chicago's Annual Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago, Chicago 1997.
- Klee E.: Retail payments 1995-2001: findings from aggregate data and the survey of consumer finances. Board of Governors of the Federal Reserve System, Washington 2004.
- Kotkowski R. (red.), Dulinicz M., Maciejewski K., Zwyczaj płacnicze w Polsce w 2020 r. Podstawowe wyniki badania, NBP, Warszawa 2021.
- Koźliński T.: Porównanie wyników badań ubankowienia Polaków przeprowadzonych przez Narodowy Bank Polski w 2006 i 2009, NBP, Warszawa 2009.
- Koźliński T.: Zwyczaj płacnicze Polaków, NBP, Departament Systemu Płacniczego, Warszawa 2013.
- Krzyżkiewicz Z.: Operacje bankowe, [in:] W.L. Jaworski, Z. Zawadzka (eds), *Bankowość. Podręcznik akademicki*, Poltext, Warszawa 2008.
- Łapczyński M.: Analiza porównawcza tabeli kontyngencji i metody CHAID, *Zeszyty Naukowe, Akademii Ekonomicznej w Krakowie*, 659/2005, p. 151.
- Maison D.: Postawy Polaków wobec obrotu bezgotówkowego. Raport z badania 2016 i analiza porównawcza z danymi z 2009 i 2013 roku, NBP, Warszawa 2017.
- Meijer R.W.: The Single European Cash Area: Towards a more efficient European cash society, *Journal of Payments Strategy & Systems*, 4, 3/2010, p. 1-9.
- Mot E.S., Cramer J.S., van der Gulik E.M.: De keuze van een betaalmiddel, SEO rapport nr 228, Stichting voor Economisch Onderzoek der Universiteit van Amsterdam, Amsterdam 1989.
- Nawojczyk M.: Przewodnik po statystyce dla socjologów, Wydawnictwo Predictive Solutions, Kraków 2010.
- Payments in Sweden 2020, Sveriges Riksbank, 2020, <https://www.riksbank.se/en-gb/payments--cash/payments-in-sweden/payments-in-sweden-2020/1.-the-payment-market-is-being-digitalised/>, (access: 10.12.2021).
- Porównanie wybranych elementów polskiego systemu płacniczego z systemami innych krajów Unii Europejskiej za 2018 r., NBP, Departament Systemu Płacniczego, Warszawa 2020.
- Report The Little Data Book on 18 Financial Inclusion, Global Index Database, World Bank Group, Washington 2018, <https://openknowledge.worldbank.org/bitstream/handle/10986/29654/LDB-FinInclusion2018.pdf?sequence=1&isAllowed=y> (access: 09.05.2020).
- Saiti D., Kiselick M., Josimovski S.: Level of customer satisfaction from electronic banking services in the Polog region, *Journal of Sustainable Development*, 5 (13)/2015, p. 45-68.
- Schuh S., Stavins J.: Why Are (Some) Consumers (Finally) Writing Fewer Checks? The Role of Payment Characteristics, Federal Reserve Bank of Boston, Boston 2007.
- Stola E.: Ubankowienie społeczeństwa a rozwój sektora bankowego w Polsce, *Rozprawy Ubezpieczeniowe. Konsument na rynku usług finansowych*, 30, 4/2018, p. 81-95.

Stavins J.: Effect of Consumer Characteristics on the Use of Payment Instruments, New England Economic Review, 3/2001, p. 19-31.
Suchecka J.: Metody statystyczne. Zarys teorii i zadania, Wydawnictwo Wydziału Zarządzania Politechniki Częstochowskiej, Częstochowa 2003.
Ustawa z dn. 29 sierpnia 1997 r. Prawo bankowe, Dz.U. z 1997 r., Nr 140, poz. 939 as amend.
Ustawa z dnia 23 kwietnia 1964 r. Kodeks cywilny, Dz.U. z 1964 r., Nr 16, poz. 93 as amend.
ZrozumFinanse.pl, http://zrozumfinanse.pl/poland/portal/sloownik/sloownik_1663.htm (access: 23.12.2017).

Czynniki społeczno-demograficzne a ubankowienie społeczeństwa polskiego

Streszczenie

Celem opracowania była ocena stopnia zaawansowania obrotu bezgotówkowego wśród mieszkańców Polski – konsumentów oraz określenie związku między czynnikami społeczno-demograficznymi a ubankowaniem Polaków. Oceny stopnia zaawansowania obrotu bezgotówkowego społeczeństwa dokonano za pomocą zdefiniowanych przez autorkę opracowania trzech poziomów ubankowania. Na podstawie przeglądu literatury sformułowano hipotezę badawczą: istnieje statystycznie istotny związek pomiędzy cechami społeczno-demograficznymi a ubankowaniem konsumentów.

Hipotezę badawczą zweryfikowano na podstawie wyników własnych badań z wykorzystaniem kwestionariusza ankiety przeprowadzonych na przełomie października i listopada 2019 roku na próbie 500 dorosłych Polaków (18 lat i więcej). Wyniki badania empirycznego generalnie potwierdziły statystycznie istotny wpływ cech społeczno-demograficznych na poziom ubankowania Polaków. Istotny wpływ na ubankowanie społeczeństwa polskiego mają wiek, poziom wykształcenia, dochód netto w przeliczeniu na jedną osobę w gospodarstwie domowym, rodzaj wykonywanej pracy. Nieistotne statystycznie okazały się zmienne takie jak płeć i miejsce zamieszkania. Badania wykazały, że 10% badanej populacji stanowiły osoby nieubankowane, a aż 87,20% reprezentowało poziom 3 (pełne ubankowanie).

Problem wykluczenia transakcyjnego dotyczy osób młodych w wieku 18-24 lata oraz osób starszych w wieku powyżej 61 lat. W grupie nieubankowanych znaleźli się przede wszystkim rolnicy, robotnicy niewykwalifikowani, bezrobotni oraz emeryci i renciści, a w ramach poziomu 3 – głównie pracownicy biurowi, umysłowi oraz robotnicy wykwalifikowani. Najmniejsze wykluczenie występuje u osób w wieku produkcyjnym 25-44 lata. Osoby z tego przedziału wiekowego stanowiły ponad 40% udziału w ramach poziomu 3. Wraz ze wzrostem poziomu wykształcenia następuje przesunięcie osób do coraz wyższych poziomów pod względem ubankowania. Badania wykazały, że im wyższy dochód netto w przeliczeniu na jedną osobę, tym wyższy poziom ubankowania wśród Polaków. Wyniki przeprowadzonych badań stanowią uzupełnienie dotychczasowych analiz oraz wskazują propozycje działań dla instytucji promujących obrót bezgotówkowy wśród społeczeństwa polskiego.

Słowa kluczowe: ubankowanie, płatności bezgotówkowe, czynniki społeczno-demograficzne

Kody JEL: D10, G11, R20

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THE EVOLUTION OF THE ENERGY SYSTEMS OF UKRAINE AND THE ORGANIZATION OF MANAGEMENT ACCOUNTING IN ENERGY COMPANIES IN CONDITIONS OF RISK

An essential prerequisite for the development of Ukraine is a rationally formed energy system that covers the electricity demand of society and assures the smooth functioning of the national economy. The study presents the characteristics of different types of power plants in Ukraine, such as thermal, hydraulic, nuclear, geothermal, and tidal. Furthermore, the share of Ukraine's contribution to the energy supply of other countries is indicated.

Today, the United Energy System of Ukraine is one of Europe's most significant energy complexes with seven regional electric power systems (REES), including Dnipro, Western, Crimean, Southern, Southwestern, Northern, and Central. The research presents the structure of electricity consumption by consumer groups in Ukraine. It indicates the extent of the destruction of Ukraine's energy capacities by Russia's invasion. The issue of developing electricity production from alternative energy sources in Ukraine is discussed.

Permanent risks and the threat of destruction of energy system objects encourage managers of economic entities to carefully search for quick and accurate problem-solving tools for avoiding critical situations. The accounting system, in particular, management accounting, provides the informational component that satisfies the timeliness of providing boards with recommendations on making managerial decisions. The study highlights and describes the stages of implementation of management accounting in energy supply companies in Ukraine. The effectiveness of management accounting in this aspect is emphasized.

Keywords: energy systems, energy capacities, risks, management accounting, Ukraine

JEL Codes: M40, B14, M

Introduction

The evolutionary development of the energy system of Ukraine accelerated in the 20th century. It was determined by several critical stages, including: (1) the construction of a hydroelectric power plant on the Dnipro and industrial power plants in the Donbas in 1928, the extension of energy capacities by state district power plants in 1940; (2) the devastation of power plants in 1941-1945; (3) the overhaul and modernization of diesel power plants, power trains, small hydroelectric power stations in the post-war period; (4) the integration of energy systems and most of the country's energy enterprises and organizations by the Ministry of Energy and Electrification of Ukraine in 1962; (5) launching the nuclear power

units in Chornobyl, South-Ukrainian, Zaporizhzhya, Rivne, Khmelnytsky NPPs in the 70s; and (6) Kakhovsk, Kremenchutsk, Dniprodzerzhinsk, Kanivsk HPP, and Dnipro HPP-2 starting operations in Prydniprovsk, as well as, over time, in Kryvorizska, Zaporizhia, Zmiivska, Vuglegirska, and Zuyivska DRES in 1963 (Figure 1).

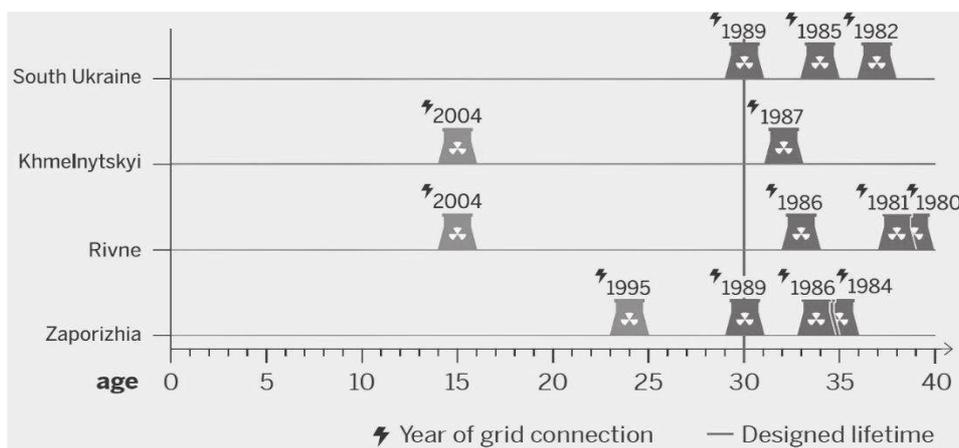


Figure 1. Age of nuclear reactors in Ukraine

Source: Age of nuclear reactors in Ukraine, Ecoaction, 2022. <https://en.ecoaction.org.ua> (access: 21.11.2022).

Currently, energy is strategically important for the Ukrainian economy. The country has 15 nuclear reactors located at four nuclear power plants. Their safe and stable work depends on the day-to-day uninterrupted functioning of all spheres of the Ukrainian economy.

Theoretical and historical overview

There was extensive research on the energy sector conducted in Ukraine and worldwide. Zakeri¹ examined the impacts of the entire energy system – including fuel supply, renewable energy investment, demand for energy services, and implications for energy equity – through a review of recent research and expert advice in the field and recommended policy to overcome the challenges toward achieving resilient and sustainable energy systems, driven mainly by energy services. Recently, some research work has been devoted to Russia’s military aggression against Ukraine and its influence on the national energy sector². Yakymchuk A.T and others³ analyzed active methods of state energy protection in Ukraine and the world.

¹ B. Zakeri, K. Paulavets, L. Barreto-Gomez, L.G. Echeverri, S. Pachauri, B. Boza-Kiss, S. Pouya: Pandemic, war, and global energy transitions, *Energies*, 15 (17)/2022, 6114, <https://www.doi.org/10.3390/en15176114/>

² X.-Yin. Zhou, G. Lu, Z. Xu, X. Yan, S. Khu, J. Yang, J. Zhao, J.: Influence of Russia-Ukraine war on the global energy and food security. *Resources, Conservation and Recycling*, 188/2023, 106657, <https://www.doi.org/10.1016/j.resconrec.2022.106657/>

³ A. Yakymchuk, O. Kardash, N. Popadynets, V. Yakubiv, Y. Maksymiv, I. Hryhoruk, I., T. Kotsko: Modeling and governance of the Country's energy security: The example of Ukraine, *International Journal of Energy Economics and Policy*, 12 (5)/2022, p. 280-286.

At the same time, the issue of energy system accounting was studied by Göke L.⁴, who discussed the current governance process to plan the energy system and the application of a comprehensive capacity expansion model to modeling framework for comparison of alternative planning approaches for a fully renewable energy system. Shapoval⁵ presented studies of solar coating with a direct coolant supply.

At the beginning of the 20th century, the plan of The State Electrification Commission (GOELRO) was developed, according to which almost a third of the new energy capacities were planned to be introduced in Ukraine. In April 1928, the first All-Ukrainian Energy Congress was convened, at which the electrification plan of Ukraine under the GOELRO project was discussed. In particular, the building of a powerful hydroelectric power plant on the Dnipro and industrial power plants in Donbas was confirmed.

At the end of 1940, the capacity of Ukraine's power plants was 2,630 MW, and electricity production reached 12.41 billion kWh. State district power plants, which produced more than 85% of electricity, became the basis of energy in Ukraine.

In the first period of the 1941-1945 war, the work of energy enterprises was directed mainly at meeting the needs of the front and rear. Before the occupation of Ukraine, the central part of the power plant equipment was dismantled and evacuated to the east. The remaining equipment was destroyed.

In the first post-war years, the shortage of energy capacities was acutely felt as diesel power plants, power trains, small hydroelectric power plants, and other means had to be used. The reconstruction of power plants was simultaneously carried out with their technical improvement and the use of advanced scientific and technological achievements at that time. Equipment with high steam parameters was introduced, and automation of production processes and control of unit operation modes were used.

The rapid growth of residential and industrial construction, science, and technology characterized the next development period of Ukraine's economy. In 1962, Ukraine's Ministry of Energy and Electrification was created, which united all energy systems and most energy enterprises and organizations.

In the 70s, the commissioning of nuclear power units with RBMK and VVER reactors (Chornobyl, South-Ukrainian, Zaporizhzhya, Rivne, and Khmelnytsky NPPs) took place. The further development of power grids of all voltage classes from 0.4 to 750 kV made it possible to combine all energy systems into a single powerful energy system. A cascade of hydroelectric power stations on the Dnipro was created at an accelerated pace. From 1950 to 1980, Kakhovsk, Kremenchutsk, Dniprodzerzhinsk, Kanivsk HPP, and Dniprovsk HPP-2 were built.

In 1963, the 300 MW power units were put into operation at Prydniprovsk and later at Kryvorizska, Zaporizska, Zmiivska, Vuglegirska, and Zuivska DRES. Every year, the energy capacity of Ukraine has been constantly increasing. In 1999, the President of Ukraine formed the Ministry of Fuel and Energy of Ukraine by combining the Ministry of Energy, the Ministry of the Coal Industry, the State Department of Electric Power, the

⁴ L. Göke, M. Kendziorski, C. Kemfert, C.V. Hirschhausen: Accounting for spatiality of renewables and storage in transmission planning, *Energy Economics*, 113/2022, <https://www.doi.org/10.1016/j.eneco.2022.106190/>

⁵ S. Shapoval, N. Spodyniuk, O. Datsko, P. Shapoval: Research of efficiency of solar coating in the heat supply system. *Pollack Periodica*, 17 (1)/2022, p. 128-132, <https://www.doi.org/10.1556/606.2021.00420>

State Department of the Oil, Gas, and Oil Refining Industry, and the State Department of Nuclear Energy, was formed (Figure 2).



Figure 2. Power stations of Ukraine – overview map

Source: System energetyczny Ukrainy, Biuro PTPiREE, 2022, <https://e-elektryczna.pl/rynek-i-regulacje/system-energetyczny-ukrainy/> (access: 08.11.2022).

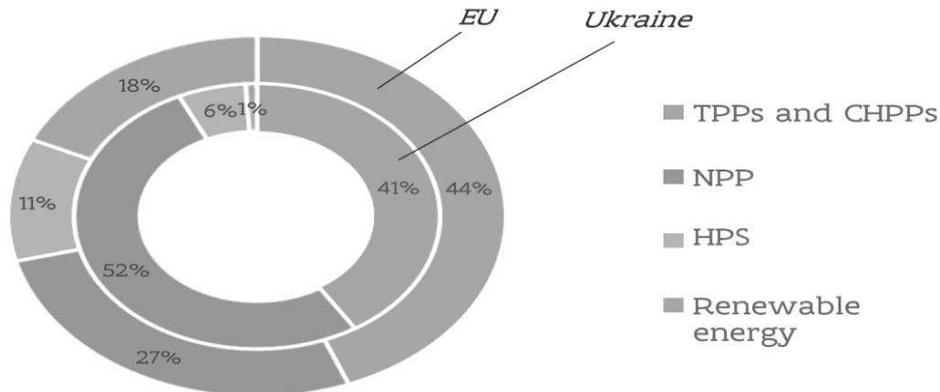
Research methodology

The research is based on methods of scientific knowledge, retrospective analysis, systematization, comparison, grouping, synthesis, and generalization when formulating and scientifically substantiating research results.

The research utilizes the method of scientific knowledge. Historical and systemic approaches were used to highlight the processes of evolutionary development of the energy system of Ukraine; the method of generalization was applied to generalize and highlight the classification features of power plants; for the study of statistical material on electricity consumption in Ukraine, methods of analysis and synthesis; to assess the destruction of energy system objects, methods of observation and generalization; for the visual display of research results, calculation-analytical and graphic methods; to standardize the stages of implementation of management accounting in energy supply companies of Ukraine, the forecasting method.

Empirical findings

The energy industry in Ukraine forms a massive part of the country's economy. Historically, Ukraine played one of the leading roles in the energy supply for its population and other countries. Figure 3 presents the electricity production structure in Ukraine compared to the EU. However, it is difficult to determine the optimal electricity generation structure as energy sectors in each country have their peculiarities and challenges.



*TPP – Thermal power plants
 CHPP – Combined heat and power plants
 NPP – Nuclear power plants
 HPS – Hydroelectric power plants

Figure 3. Structure of electricity production in Ukraine and the EU in 2020, %*
 Source: International Energy Agency, State Statistics Service of Ukraine. Eurostat.

Today, the United Energy System of Ukraine (UES) is one of the most significant energy actors in Europe – which includes seven regional electric power systems (REES) of Dnipro, Western, Crimean, Southern, South-Western, Northern, and Central –inter-connected by system-forming and power transmission lines (LEP) of 750 kV and 330-500 kV.

In December 2021, the volume of electricity production by power plants of the UES of Ukraine amounted to 15,251 million kWh, decreasing by 30 million kWh (or by 0.2%) compared to December 2020 (Figure 4).

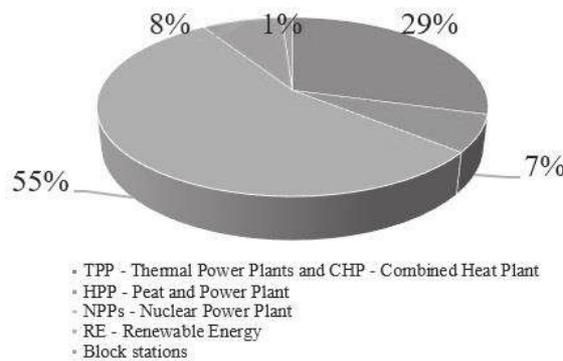


Figure 4. Structure of electricity production in the United Energy System (UES) of Ukraine in 2021
 Source: About the main indicators of the work of the PEK of Ukraine for January-December 2021, NGO Scientific and Technical Union of Power Engineers and Electrical Engineers of Ukraine, Kyiv 2022, p. 83.

In 2021, there was an increase in gross electricity consumption, which amounted to 154,857.6 million kWh, which was 8,422.8 million kWh or 5.8% more than last year.

In December 2021, electricity consumption increased by 8,422.8 million kWh (or 5.43%) compared to December 2020, which amounted to 154,857.6 million kWh. Net electricity consumption by the branches of the national economy and the population in December 2021 constituted 125,654.8 million kWh, which is 7,748.0 million kWh (or 6.16%) more than the same indicator in 2020 (Table 1).

Table 1. The structure of electricity consumption in Ukraine (2021)

Groups of consumers	Consumption in 2020	Consumption in 2021		Specific weight, %	
	million kWh	million kWh	+/-	2020	2021
Electricity consumption (gross)	146,434.8	154,857.6	8,422.8		
Electricity consumption (net)	117,906.8	125,654.8	7,748.0	100.0	100.0
1. Industry (total)	49,307.4	52,392.0	3,084.6	41.8	41.7
Fuel	3,232.2	3,270.9	38.7	2.7	2.6
Metallurgical	27,134.9	28,965.1	1,830.1	23.0	23.1
Chemical and petrochemical	4,156.1	4,331.6	175.5	3.5	3.4
Machine building	3,163.6	3,559.5	395.9	2.7	2.8
Building materials	2,333.2	2,674.9	341.6	2.0	2.1
Food and processing	4,341.4	4,401.8	60.3	3.7	3.5
Another one	4,946.0	5,188.3	242.3	4.2	4.1
2. Agricultural consumers	3,796.9	3,695.4	-101.5	3.2	2.9
3. Transport	5,712.5	6,159.4	446.9	4.8	4.9
4. Construction	956.8	1,069.7	112.9	0.8	0.9
5. Com.-household consumers	14,195.8	14,967.9	772.2	12.0	11.9
6. Other non-industrial consumers	7,383.2	8,591.9	1,208.7	6.3	6.8
7. Population	36,554.1	38,778.5	2,224.4	31.0	30.9

* (without taking into account the temporarily occupied territories of the Republic of Crimea, the city of Sevastopol, Donetsk, and Luhansk regions)

Source: History of energy, Ministry of Energy of Ukraine, 2022, <https://www.mev.gov.ua/storinka/istoriya-enerhetyky/> (access: 11.11.2022).

On March 16, 2022, a historical event occurred as the Ukrainian power system was finally disconnected from the power grid of Russia and Belarus. Against the background of the Russian invasion, more than a year ahead of schedule, the energy system of Ukraine was fully synchronized with the power grid of continental Europe ENTSO-E⁶.

Since 2014, Ukraine has been in a state of war, with a full-scale Russian invasion on February 24, 2022. Specific solutions have already been introduced and worked out in the territories of Ukraine. During the conflict, Ukraine suffered significant destruction in the electric power sector as the energy sector became one of the main targets of Russia's military aggression. Therefore, at the beginning of the invasion, 57% of TPP capacity (17.4 GW) was under direct threat of destruction, and 27% (8.2 GW) were located in areas adjacent to where military actions for the defense of Ukraine took place. The situation was similar in renewable energy (RES), with more than 75% or 6.4 GW of Ukrainian RES capacity being in the risk zone, 47% of RES or 3.9 GW in the regions where military actions took place, and 29% or 2.4 GW in adjacent areas. Therefore, starting on February

⁶ History of energy, Ministry of Energy of Ukraine, 2022, <https://www.mev.gov.ua/storinka/istoriya-enerhetyky/> (access: 09.11.2022).

24, 2022, Ukraine introduced several regulatory changes in the energy field designed to stabilize the industry and solve critical problems.

Moreover, Ukraine lost control over the 6 GW Zaporizhzhya nuclear power plant. It faced new challenges such as threats of nuclear terrorism and considerable damage to critical infrastructure, including electricity and gas networks⁷. According to the latest published data, the destruction of the Kakhovskaya hydroelectric power station containing about 19 million cubic meters of water could lead to the flooding of 80 settlements, including the regional center of Kherson. As a result, an artificial ecological disaster would eliminate the possibility of supplying water from the Dnipro to Crimea since the North Crimean Canal would disappear in the event of the destruction of the dam. The following critical dates for the energy sector were October 10-19, 2022, since Russia damaged 30% of Ukraine's energy infrastructure after mass shelling (Figure 5). As a result, a large amount of primarily thermal electricity generation, which was maneuverable and allowed for a rapid increase in production volumes, was lost. Part of it was restored, but on October 20, 2022, starting a heating period began throughout Ukraine. Still, the government of Ukraine was forced to carry out fan power outages in the country's northern, central and eastern regions to stabilize the energy supply.

The decision of the Cabinet of Ministers of Ukraine to suspend the export of electricity due to the Russian attacks on the infrastructure facilities of Ukraine had a negative effect on European countries because it was the Ukrainian electricity supplied to Poland and Moldova that helped reduce dependence on Russian gas.



Figure 5. Attacks on the energy structure of Ukraine for 10.10.2022

Source: Ukrainians are asked to limit electricity consumption on the evening of October 10, Zhytomyr.info., 2022, https://www.zhytomyr.info/news_210164.html/ (access: 15.11.2022).

One of the ways out, of course, in times of peace would be in-depth financing for obtaining energy from renewable sources (RES). Due to its size and diversity of natural

⁷ Energy during the war in Ukraine: what changes in regulation? Jurliga, 2022, https://jurliga.ligazakon.net/aktualno/12602_energetika-pd-chas-vyni-v-ukran-yak-zmni-v-regulyuvann (access: 21.10.2022).

landscape, Ukraine has a significant potential for alternative energy production. Renewable energy sources have attracted considerable interest, but they accounted for only 1.3% of energy production in Ukraine in 2016, with another 6.1% coming from large hydroelectric plants. However, after the occupation of Ukrainian territories by Russia, control of 75% of RES was lost.

In the pre-war period, the Ukrainian alternative energy sector was considered the largest international player and one of the fastest-growing and most attractive European markets among developing economies. It was planned to build powerful solar power plants in the Chernobyl Exclusion Zone.

For many years, Ukraine has been making efforts to stimulate the generation of electricity from alternative sources of energy financially. Such stimulations resulted in legislative provisions for feed-in tariffs, i.e., the guaranteed obligation of the state to purchase generated ‘green’ power from alternative energy producers. The following types of RES were eligible for the green tariff: wind, solar, biomass (originating from waste, as well as remains of agriculture and forestry sectors), biogas, micro-/mini-/small hydroelectric power plants, and geothermal energy. However, placing renewables differently has no significant effect in the Ukrainian case because the available potential must be exploited almost entirely, leaving little room for optimization. Furthermore, sensitivity to the first-best scenario entirely prohibiting additional transmission lines suggests that grid expansion can be substituted at tolerable costs⁸.

Below is the map showing the geography of the commissioned and the potential RES projects in Ukraine by type of RES (Figure 6).



Fig. 6. The commissioned and potential RES projects in Ukraine

Source: Baker&McKinsey, <https://www.bakermckenzie.com/> (access: 02.12.2022).

Comparing graphs and charts of Ukrainian energy production with indicators of European countries, one can pay attention to Denmark, Estonia, and Germany, where the most significant amount of renewable energy (new RE) among European countries was

⁸ L. Göke, M. Kendziorski, C. Kemfert, C.V. Hirschhausen: Accounting for spatiality of renewables and storage in transmission planning. *Energy Economics*, 113/2022, <https://www.doi.org/10.1016/j.eneco.2022.106190/>

located. Ukraine should consider the experience of these countries and adopt appropriate steps to improve its energy capacity (Figure 7).

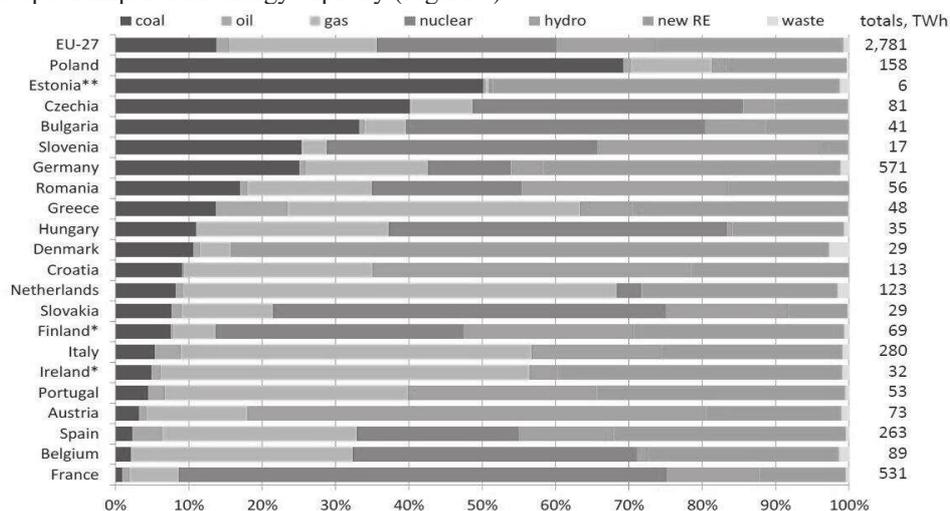


Figure 7. Energy mix for EU electricity generation, 2020

Source: Eurostat database nrg_bal_peh, <https://euracoal.eu/info/euracoal-eu-statistics/> (access: 14.04.2022).

Constant risks, conditions of uncertainty and threats of destruction of energy system objects encourage business entities at the macro-, meso- and micro-levels to respond quickly. These events require managers of all levels to solve tasks rapidly and without errors to avoid critical situations. In this chain, the accounting system – in particular, management accounting – provides the informational component that satisfies the timeliness of providing management with recommendations for making management decisions.

Management accounting is entirely subordinate to the requests of the company's management. Its effectiveness is ensured by focusing on specific economic tasks, the solution of which is based on relevant information about expenses and income⁹.

In Ukraine, the place of management accounting largely depends on which concept, American or European-continental, the company uses. The European-continental concept of management accounting, identified with the organizational idea of controlling, is mainly implemented in Ukrainian enterprises. It is pretty natural, given the similar definition of accounting in Europe and Ukraine¹⁰.

The analysis of financial and organizational approaches to the introduction of management accounting at Ukrainian enterprises, particularly at energy supply companies, made it possible to identify the stages presented in Figure 8.

⁹ S.O. Levitska, I.V. Stovpovets: Administrative (internal) accounting of business entities: organization methodology, development prospects. Bulletin of the National University of Water Management and Nature Management, Economy, Rivne: NUVHP, 2 (38)/2007, p. 199-209.

¹⁰ S.F. Golov: Upravlin'skyj oblik i kontrolinh: koncepciji ta zastosuvannia, Wisnyk KNTEU: Naukovo-praktycznyj žurnal, 5/2007, p. 82-87.

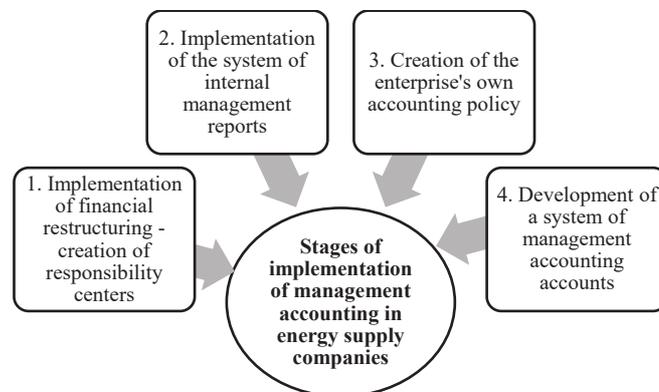


Figure 8. Stages of implementation of management accounting in energy supply companies

Source: created by the authors: I.O. Levitska: Management accounting and audit of costs for the supply and transmission of electrical energy of energy supply companies of Ukraine: Diss... candidate. Economy Sciences, 08.00.09/2015. p. 247-248.

The first stage refers to allocating four types of responsibility centers: a cost center, a revenue center (or a realization/sales center), a profit center, and an investment center (financing, supply). Taking into account the need for comparability of management and accounting indicators to ensure correct decision-making in matters of tariff formation, it is advisable to speak for expenses accounted for according to the principles of Ukrainian National Accounting Standards. The most important and appropriate for the company's management is the data obtained from the cost center – a structural unit of the enterprise in which the managers are responsible for the costs incurred during the activity.

To regulate the cost process of enterprises, including energy supply companies, it is necessary to systematically create financial reports (as a rule, in tabular form) and analyze the activity results in graphic schemes, diagrams, and drawings. It is advisable to introduce a three-level structure of management financial reports: financial reports of the first level – management balance sheet, management report on financial results, management report on the flow of funds; second-level financial reports – reports that are supplementary to first-level reports (for example, a report on receivables, a report on purchases, a report on payables, a report on expenses, etc.); third-level reports – primary financial documentation (invoices, waybills, etc.).

A prerequisite for the accounting policy is the development and consolidation of the method of accounting and grouping of enterprise costs, and the determination of the system for calculating the cost of products (goods, works, services). Furthermore, in the accounting policy, it is necessary to specify the functional distribution of management accounting in the company's departments, to determine the degree of responsibility of each of them, and to establish responsibility for the reliability and quality of management accounting in the relevant internal documents of the enterprise.

The chart of accounts of management accounting can be built following the current working chart of accounts in the enterprise, based on national accounting standards – or an alternative – following international accounting standards.

Conclusions

The United Energy System of Ukraine is one of the largest energy centers in Europe, which includes seven regional electric energy systems (REES): Dnipro, Western, Crimean, Southern, South-Western, Northern, and Central, united by system-forming and main power transmission lines (LEP). Such an infrastructure is the basis of the country's electric power industry, which provides a centralized energy supply to its consumers and interacts with the energy systems of neighboring countries, ensuring the export and import of electricity.

However, the full-scale invasion of Russia has long-term consequences for Ukraine and all participants in the energy market and the world economy, experts of the International Energy Agency (IEA). Considering the conditions of uncertainty and the risks of losing part of assets and capacities in wartime, energy supply companies of Ukraine should have specific ready-made solutions, which are provided by properly organized and effective management accounting. To achieve this priority, the following requirements should be considered:

- carrying out an economic settlement with interested parties involved in the production, transmission, distribution, and consumption of electricity;
- providing complete information to the board of directors to ensure the goals of management accounting;
- developing technological processes of management accounting to ensure the quality of accounting information and the cost-effectiveness of the process of its formation;
- referring to the specificity of the company's activities – in particular, the peculiarities of calculating the cost of electricity, accounting for the costs of transmission and supply of electricity, and determining the results of business decisions.

References

- About the main indicators of the work of the PEK of Ukraine for January-December 2021, NGO Scientific and Technical Union of Power Engineers and Electrical Engineers of Ukraine, Kyiv 2022
- Age of nuclear reactors in Ukraine, Ecoaction, 2022. <https://en.ecoaction.org.ua> (access: 21.11.2022).
- Baker&McKinsey, <https://www.bakermckenzie.com/> (access: 02.12.2022).
- Energy during the war in Ukraine: what changes in regulation? Jurliga, 2022, https://jurliga.ligazakon.net/aktualno/12602_energetika-pd-chas-vyni-v-ukran-yak-zmni-v-regulyuvann (access: 03.12.2022).
- Eurostat database nrg_bal_peh, <https://euracoal.eu/info/euracoal-eu-statistics/> (access: 14.04.2022).
- Göke L., Kendzioriski M., Kemfert C., Hirschhausen C.V.: Accounting for spatiality of renewables and storage in transmission planning. *Energy Economics*, 113/2022, <https://www.doi.org/10.1016/j.eneco.2022.106190/>
- Golov S.F.: Upravlinśkyj oblik i kontrolinh: koncepciji ta zastosuvannia, *Wisnyk KNTEU: Naukowo-praktycznyj žurnal*, 5/2007, p. 82-87.
- History of energy, Ministry of Energy of Ukraine, 2022, <https://www.mev.gov.ua/storinka/istoriya-enerhetyky/> (access: 11.11.2022).

- Levitska I.O.: Management accounting and audit of costs for the supply and transmission of electrical energy of energy supply companies of Ukraine: Diss... candidate, Economy Sciences, 08.00.09/2015. p. 247-248.
- Levitska S.O., Stovpovets I.V.: Administrative (internal) accounting of business entities: organization methodology, development prospects. Bulletin of the National University of Water Management and Nature Management, Economy. Rivne: NUVHP, 2 (38)/2007, p. 199-209.
- Makhdoomi H., Moshtagh J.: Optimal Scheduling of Electrical Storage System and Flexible Loads to Participate in Energy and Flexible Ramping Product Markets, Journal of Operation and Automation in Power Engineering, 11 (3)/2023, p. 203-212, <https://www.doi.org/10.22098/JOAPE.2023.10258.1729/>.
- Shapoval S., Spodyniuk N., Datsko O., Shapoval P.: Research of efficiency of solar coating in the heat supply system. Pollack Periodica, 17 (1)/2022, p. 128-132, <https://www.doi.org/10.1556/606.2021.00420>
- System energetyczny Ukrainy, Biuro PTPiREE, 2022, <https://e-elektryczna.pl/rynek-i-regulacje/system-energetyczny-ukrainy/> (access: 22.11.2022).
- Ukrainians are asked to limit electricity consumption on the evening of October 10, Zhytomyr.info, 2022, https://www.zhitomir.info/news_210164.html/ (access: 22.11.2022).
- Yakymchuk A., Kardash O., Popadynets N., Yakubiv V., Maksymiv Y., Hryhoruk I., Kotsko T.: Modeling and governance of the Country's energy security: The example of Ukraine, International Journal of Energy Economics and Policy, 12 (5)/2022, p. 280-286.
- Zakeri B., Paulavets K., Barreto-Gomez L., Echeverri L.G., Pachauri S., Boza-Kiss B., Pouya S.: Pandemic, war, and global energy transitions, Energies, 15 (17)/2022, 6114, <https://www.doi.org/10.3390/en15176114/>
- Zhou X.-Yin., Lu G., Xu Z., Yan X., Khu S., Yang J., Zhao, J.: Influence of Russia-Ukraine war on the global energy and food security. Resources, Conservation and Recycling, 188/2023, 106657, <https://www.doi.org/10.1016/j.resconrec.2022.106657/>

Ewolucja systemów energetycznych Ukrainy i organizacja rachunkowości zarządczej w przedsiębiorstwach energetycznych w warunkach ryzyka

Streszczenie

Niezbędnym warunkiem rozwoju Ukrainy jest racjonalnie ukształtowany system energetyczny, który zaspokaja zapotrzebowanie na energię elektryczną społeczeństwa i zapewnia sprawne funkcjonowanie gospodarki narodowej. Artykuł przedstawia charakterystykę różnych typów elektrowni w Ukrainie, takich jak ciepłne, wodne, jądrowe, geotermalne, pływowe. Ponadto wskazano udział wkładu Ukrainy w zaopatrzenie energetyczne innych krajów. Obecnie Zjednoczony System Energetyczny Ukrainy jest jednym z najważniejszych ośrodków w Europie, w którego skład wchodzi siedem regionalnych systemów energetycznych (REES), w tym Dniprowski, Zachodni, Krymski, Południowy, Południowo-Zachodni, Północny oraz Środkowy.

Badania prezentują strukturę zużycia energii elektrycznej według różnych grup odbiorców w Ukrainie. Przedstawiono skalę zniszczenia zdolności energetycznych Ukrainy przez działania militarne Rosji. Wyróżniono kwestię rozwoju wytwarzania energii elektrycznej z alternatywnych źródeł energii w Ukrainie.

Stałe ryzyka i zagrożenie zniszczenia obiektów systemu energetycznego motywują zarządzających podmiotami gospodarczymi do rzetelnego poszukiwania narzędzi do szybkiego i precyzyjnego rozwiązywania zadań w celu uniknięcia sytuacji krytycznych. System rachunkowości, w szczególności rachunkowość zarządcza, uzupełnia wymiar informacyjny,

zapewniając terminowość przekazywania kierownictwu zaleceń dotyczących podejmowania decyzji zarządczych. Wyróżniono i opisano etapy wdrażania rachunkowości zarządczej w spółkach energetycznych Ukrainy. Podkreślono skuteczność rachunkowości zarządczej w tym aspekcie.

Słowa kluczowe: systemy energetyczne, mocy energetyczne, ryzyka, rachunkowość zarządcza, Ukraina

Kody JEL: M40, B14, M14

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MACROECONOMIC FACTORS AS TOOLS FOR STIMULATION OR DESTIMULATION OF AGRIBUSINESS LOANS IN CRISIS SITUATION

The study attempts to identify changes in the loan market for agribusiness enterprises, including farms in Poland, during the COVID-19 pandemic. The research used data from the Central Statistical Office and the Credit Information Bureau for 2017-2020. In the course of research, an econometric model was constructed explaining the volume of loans to the above-mentioned entities by commercial and cooperative banks in Poland during the pandemic. The program Statistica 13.3 was used. The analysis covers all loans granted in Poland on a monthly basis in 2017-2021. During this period, banks granted a total of 307 012 loans to individual farmers, and their volume amounted to almost PLN 30 billion. In the course of the research, it was found that in the years 2017-2021, the volume of loans for agribusiness entities, including farms, was decisively influenced by such factors as refinancing loan rate (stimulant), rediscount rate (destimulant), and general economic climate in manufacturing index (stimulant). The set of explanatory variables in the models may be a premise for the introduction of specific improvements in the credit policy of banks servicing agribusiness in the form of tightening or liberalizing credit requirements. The research results can also be used by banks to effectively plan future sales targets and interest income from these loans.

Keywords: agribusiness enterprises, loan volume, COVID-19 pandemic

Jel Codes: G21, G23, G24, G28

Introduction

Modernized agribusiness enterprises, including farms, are characterized by a greater demand for credit; moreover, these enterprises, operating in the conditions of a market economy and a competitive environment – similarly to economic entities from other sectors – must modernize their activities and conduct investments adjusting production to market requirements^{1,2}. In scientific studies, it can be found that the

¹ E. Grzegorzewska: Indebtedness of agricultural enterprises in Poland in the face of the global economic crisis, *Zeszyty Naukowe SGGW. Polityki Europejskie, Finanse i Marketing* 10 (59)/2013, p. 268-276.

activity of farms is financed mainly by equity³. However, the share of this capital in financing agricultural activities depends on the amount of disposable income and the tendency to resign from current consumer spending⁴. Despite the agribusiness enterprise's ability to generate a financial surplus, its size for current and investment needs is often insufficient⁵. In such cases, it is necessary to use external financing sources. It is important that the share of financing (in the structure of financing sources) generally decreases with the increase in the size of an agribusiness enterprise, especially a farm⁶.

Decisions on the selection of the best financing structure for their activities must be made by owners and by taking the specificity of agriculture as an activity into account. This includes, among others, generally long production cycles – as a result of which there are large discrepancies between the period of incurring expenditures and the period of obtaining a return on investment⁷. Another variable that agribusiness men must take into account are the fluctuations of the market situation affecting the volume of demand and the achieved financial flows⁸. The most frequently used external source of financing for agribusiness in Poland is a bank loan⁹. Such a choice may result, inter alia, from the lack of tax benefits due to financial costs – especially in farms – as is generally the case with listed companies¹⁰. Previous studies have established that well-indebted agribusiness enterprises are characterized not only by

² R. Bierlen, P.J. Barry, B.L. Dixon, B.L. Ahrendsen: Credit constraints, farm characteristics and the farm economy: Differential impact on feeder cattle and beef cow inventories, *American Journal of Agricultural Economics* 80 (4)/1998, p. 708-723.

³ S. Juszczak, R. Balina: NBP interest rates and lending to non-financial enterprises, *Bank, Miesięcznik Finansowy* 2/2017, <https://alebank.pl/nauka-stopy-procentowe-nbp-a-akcja-kredytowa-dla-przedsiębiorstw-niefinansowych/?id=224675&catid=960> (access: 10.07.2022).

⁴ J. Kulawik: Lending and financing agriculture on the eve of integration with the European Union, *Bank i Kredyt* 6/2003, p. 29-42.

⁵ R. Barro, J. Ursúa, J. Weng: The Coronavirus and the Great Influenza Pandemic: Lessons from the "Spanish Flu" for the Coronavirus's Potential Effects on Mortality and Economic Activity, 26866/2020, p. 11-12. https://www.nber.org/system/files/working_papers/w26866/w26866.pdf (access: 10.07.2022).

⁶ R. Kata: Endogeniczne i instytucjonalne czynniki kształtujące powiązania finansowe gospodarstw rolnych z bankami, *Oficyna Wydawnicza Politechniki Rzeszowskiej*, Rzeszów 2011, p. 426-429.

⁷ M. Wasilewski, T. Felczak: Efektywność strategii płynności finansowej w gospodarstwach rolniczych o zróżnicowanej sile ekonomicznej, *Zarządzanie i Finanse*, 2 (2)/2013, p. 491-501.

⁸ R. Kata: Premises and microeconomic determinants of using bank loans by farmers, *Roczniki Ekonomiczne Kujawsko-Pomorskiej Szkoły Wyższej w Bydgoszczy*, 5/2012, p. 241-260.

⁹ A. Rosa: Farmers of Central Pomerania in the banking services market, [in:] D. Zawadzka, J. Sobiech (eds), *Growth and allocation of financial and tangible assets of farmers (agricultural enterprises and households) in Central Pomerania*, Publishing House of the Koszalin University of Technology, Koszalin 2014, p. 229-260.

¹⁰ T. Felczak: Sources of financing the activities of individual farms in the opinion of managers, *Zeszyty Naukowe Uniwersytetu Szczecińskiego. Finanse, Rynki Finansowe, Ubezpieczenia* 74 (2)/2015, p. 83-101.

higher return on equity, but also especially in the case of farms with higher financial efficiency of their own work^{11,12}.

In the literature on the subject, the variability of the economic situation is expressed in business cycles. These are recurring, although not always regular in terms of amplitude, fluctuations in economic activity with a period usually from two to ten years, or even several years¹³. These fluctuations are manifested in absolute changes, deviations from the trend or fluctuations in the dynamics of various economic variables. Modern business cycles usually last from two to eight years, and their average length is usually five years¹⁴. There are four phases in the classical business cycle:

- recession;
- depression;
- boom;
- expansion.

The economic slowdown caused by various reasons affects the loan market, including the loan market for the agro-business sector – especially for individual farmers, which may manifest itself in changes in the reported demand for bank loans, changes in the value, and the number of loans granted¹⁵. It is worth noting that the COVID-19 pandemic is mainly a humanitarian crisis, but it has significant socio-economic implications. One of its effects is the disruption of economic processes and a clear limitation of economic growth. For years, Poland belonged to countries with a stable economic growth rate faster than the EU average: in 2016-2019, the average annual growth rate in Poland amounted to 4.5%, and to 2.1% in the EU. This situation changed in 2020 when, as a result of the COVID-19 pandemic, Poland experienced the first decline in GDP since the transformation of the economy, which amounted to 2.7% compared to 2019. This was one of the smaller declines among countries in the EU, where the GDP decreased by approx. 6% on average¹⁶.

It is worth emphasizing that the economic slowdown contributed to the increased risk of losing financial liquidity in economic entities. This is due to the deteriorating financial condition of enterprises and difficult access to bank financing. It

¹¹ W. Józwiak Wojciech: Ocena efektów kredytowania preferencyjnego w gospodarstwach osób fizycznych, *Zagadnienia Ekonomiki Rolnej* 4-5/1999, p. 13-26.

¹² D. Czerwińska-Kayzer, W. Poczta: Preferential loan as an instrument of structural changes in agriculture, *Więś i Rolnictwo* 3 (112)/2001, p. 99-113.

¹³ R. Beck, P. Jakubik, A. Piloju: Key Determinants of Non-performing Loans: New Evidence from a Global Sample, *Open Economies Review*, 26 (3)/2015, p. 525-550.

¹⁴ D. Hübner, M. Lubiński, W. Małecki, Z. Matkowski: *Koniunktura gospodarcza*, PWE, Warszawa 1994, p. 12-13.

¹⁵ A. Berger, R. Demsetz, P. Strahan: The consolidation of the financial services industry: Causes, consequences, and implications for the future, *Journal of Banking and Finance*, 23/1999, p. 135-194.

¹⁶ M. Wąsiński, D. Wnukowski: Skutki pandemii COVID-19 dla gospodarki światowej, *Biuletyn Polskiego Instytutu Spraw Międzynarodowych*, 84/2020, p. 1-2.

is evident in the initial phase of the crisis when the supply of credit is limited¹⁷. Despite the decline in GDP, the Polish financial system entered the COVID-19 pandemic in fairly good shape, was sufficiently resistant to shocks, and was characterized by a lack of significant imbalances in the banking system. However, the strength and nature of the shock related to the pandemic significantly increased the credit risk and, moreover, the risk of an excessive restriction of credit availability in the economy¹⁸. The scale of the macroeconomic shock related to the COVID-19 pandemic significantly increased the probability of debt service problems by some borrowers. At the same time, there was a risk of excessive limitation of credit availability¹⁹. It was particularly important concerning enterprises or individual farms, as it was partly related to the suspension of investment projects. It should be emphasized that corporate loans account for approx. one-third of the banks' loan portfolio and are sensitive to the economic situation. In total, due to its inconvenient duration, the pandemic crisis may cost the banking sector nearly PLN 14 billion in additional loan write-offs for 2020-2022. At the end of April 2020, the banks' earnings fell by 43.8% year-on-year, and ten commercial banks reported a loss. The biggest burden turned out to be write-offs for provisions and a decline in lending. The high level of credit losses at the start of the pandemic was largely due to the write-downs of expected credit losses. For banks, this was related to the sudden deterioration of the macroeconomic outlook.

At the same time, limiting the supply of loans to enterprises may adversely affect the liquidity situation of enterprises and their solvency and, consequently, the country's economic situation²⁰. The economic shock caused by the COVID-19 pandemic continues to adversely affect all sources of bank income. Among other things, it makes it difficult to raise capital and increases the risk of limiting lending. Declining the profitability of the banking sector is a key challenge in the long run. Even before the pandemic, a gradual decline in bank profitability was observed, particularly in the group of small- and medium-sized banks. However, because of a high level of own capital, the expected materialization of credit risk related to the impact of COVID-19 does not threaten the stable operation of banks.

The economic slowdown caused by the COVID-19 pandemic is visible in many sectors of the economy. At that time, the share of non-performing loans increased, and the growth rate of loans to the non-financial sector decreased. The type structure of demand for loans also changed, which – in the following years – had an impact on

¹⁷ P. Mikołajczyk: Krótkoterminowe kredyty bankowe dla przedsiębiorstw w warunkach kryzysu finansowego, *Nauki o Finansach*, 2/2014, p. 125-128.

¹⁸ C. Cheng, J. Barceló, A.S. Hartnett, R. Kubinec, L. Messerschmidt: COVID-19 Government Response Event Dataset (CoronaNet v.1.0), *Nature Human Behaviour*, 4 (7)/2020, p. 756-768.

¹⁹ A.L. Dias, E.C. Manuel, G. Dutschke, R. Pereira, L. Pereira: Economic crisis effects on SME dynamic capabilities, *International Journal of Learning and Change*, 13 (1)/2021, p. 65-78.

²⁰ M. Falagiarda, A. Prapiestis, E. Rancoita: Public loan guarantees and bank lending in the COVID-19 period, *Economic Bulletin Boxes*, 6/2020, p. 120-137.

the structure of the loan portfolio. The important thing is that credit losses are not compensated by new loans. The National Bank of Poland announced in October 2021 that the demand for bank loans remained low, with only 15% of the surveyed companies applying for a loan. At the same time, there was an increase (y/y) in the availability of bank financing; moreover, approx. 84% of submitted applications obtain a positive credit decision. According to the NBP, the balance of the expected loan demand in the fourth quarter of 2021 increased, and the increase in debt is more often announced by large companies²¹. It is worth emphasizing, however, that enterprises currently have their own (large) funds at their disposal. The debt of the non-financial corporation sector in the reports of the Central Statistical Office decreased by 2% y/y. For the first time, the decline in debt was caused by the negative growth rate of long-term debt, a decline of 1.6% y/y and short-term debt, a decline of 2.8% y/y. In the case of individual farmers, the trend was different. The data of the National Debt Register shows that the average debt of a farmer who has a loan increased by 5% over the last year and amounted to nearly PLN 68,500.

Methodological issues

The aim of the research was to identify the relationship between changes in major macroeconomic and mesoeconomic factors and the volume of loans to agribusiness enterprises, including farms in Poland, during the intensified COVID-19 pandemic (i.e., in 2017-2021). The explanatory variables adopted for the analysis are presented in Table 1. Potential independent variables are marked from X_1 to X_{19} . Explained variable Y is the volume of loans granted to enterprises of agribusiness, including individual farmers (PLN million).

The data for the analysis was collected in the MS Excel 2016 program, statistical analysis was carried out in the Statistica 13.3 program, and $p < 0.1$ was adopted for the level of significance. A variance analysis was carried out; in addition, the normality of the distribution was carried out using the Shapiro-Wilka test. When the assumptions of the normality of the distribution were met, Pearson's correlation was used to determine the existence of a correlation relationship between variables. To construct a predictive model, the correlation calculus and the forward stepwise regression calculus were used. The analysis covered all loans granted in Poland in the monthly system in 2017-2021; therefore, 60 monthly ranks from the four-year research period were analyzed. In total, during this period, banks granted 307,012 loans for the agribusiness sector, and their volume amounted to PLN 29.984 billion. The source of research materials was data from the Credit Information Bureau and the Central Statistical Office.

²¹ Szybki Monitoring NBP, NBP, https://www.nbp.pl/home.aspx?c=/ascx/koniunktura_prezentacja.ascx (access: 10.07.2022).

Table 1. Potential variables adopted in the research

X ₁	Price indices of consumer goods and services (previous year = 100)
X ₂	Registered unemployment rate (%)
X ₃	Average monthly salary in the national economy (PLN)
X ₄	Average monthly nominal pension of individual farmers (PLN)
X ₅	Average monthly nominal gross salary in the enterprise sector (PLN)
X ₆	Average employment in the enterprise sector (thousand)
X ₇	Retail sales of goods (constant prices) divided by sales in the corresponding period of the previous year multiplied by 100 (%)
X ₈	Refinancing loan rate (%)
X ₉	Rediscount rate (%)
X ₁₀	Lombard loan rate (%)
X ₁₁	Dynamics of wheat purchase prices (without seed) (%)
X ₁₃	Dynamics of cattle purchase prices (excluding calves) (%)
X ₁₄	Dynamics of pig purchase prices (%)
X ₁₅	Dynamics of milk purchase prices (%)
X ₁₆	Total sold production of industry (constant prices), analogous period of the previous year = 100%
X ₁₇	Imports of goods (constant prices) (%)
X ₁₈	General economic climate in manufacturing index (%)
X ₁₉	Registered unemployed persons (as of the end of the year) (thousand)

Source: own study.

The results of the conducted research can be used by banks and other interested institutions to determine the impact of individual macroeconomic and mesoeconomic variables in subsequent years on a dependent variable. Their changes may be the basis for introducing credit policy improvements by increasing or liberalizing credit requirements. Research results can also be used to define, for example, the future summary level of loans granted or interest revenues and can also be useful to shape the sales goals of commercial and cooperative banks.

FINDINGS

Table 2 includes the results of the variance analysis, which was carried out in order to determine whether there is a statistically significant relationship between the variable *Y* (i.e., the volume of loans for agribusiness enterprises, including farms in PLN million in a monthly system and variables independent of X₁ to X₁₉).

Table 2. Analysis of variance – dependence of the dependent variable *Y* on the set of predictors

Effect	Sum of squares	Number of degrees of freedom (df)	Mean square	<i>F</i> -test statistic	<i>p</i> -value
Regression	87,769.013	2	43,374.226	6.411	0.018
Rest	472,233.852	45	10,300.108		
Total	553,274.887				

Source: own research.

Studies have shown that there is a relationship between the volume of loans granted to agribusiness enterprises, including farms (*Y*) and a team of accepted predictors. The dependence was confirmed at level $p = 0.018$. The value of statistics *F* also indicates that these variables were significant and not accidental. The next stage of the research was aimed at clarifying which independent variables had a key impact on *Y* and the direction of this dependence. Research results in this respect are presented in Table 3.

Table 3. The influence of the set of predictors on the volume of loans for agribusiness enterprises, including farms in PLN million (Y)

Time series (months) <i>N</i> = 60	Non-standardized coefficient		t-Student statistics	<i>p</i> -value
	<i>b</i>	<i>SDE</i>		
Constant	840.555	866.832	2.012	0.049
X_8 Refinancing loan rate [%]	1,082.994	557.068	3.484	0.033
X_9 Rediscount rate [%]	-1,005.542	4,966.035	-4.056	0.021
X_{18} General economic climate in manufacturing index [%]	314.644	37.344	4.753	<0.001

Source: own research.

As a result of the tests, the following variables entered the model:

- X_8 Refinancing loan rate [%];
- X_9 Rediscount rate [%];
- X_{18} General economic climate in manufacturing index [%].

It should be emphasized that two variables were stimulants (i.e., the increase in refinancing loan rate by one percentage point was associated with an average of loans for this sector of the economy by nearly PLN 1.083 billion). Research also shows that the increase in the overall climate of the economic situation, also by one percentage point, was associated with the increase in the volume of these loans by nearly PLN 315 million. One of the variables (i.e., the rediscount rate) was a desstimulant because its increase by one percentage point was associated with a decrease in the volume of loans granted to the agribusiness sector by over PLN 1.006 billion. It should be added that, generally, the increase in this rate reduces the creation of money and vice versa. The rediscount rate is mainly used to calculate the price, after which the central bank accepts bills of exchange from commercial banks. It is also worth noting that this rate has the middle level among the five interest rates of the

National Bank of Poland. The higher level has a Lombard rate and discount rate, while the lower level has a reference rate and the lowest deposit rate.

In the next stage of the analysis, an attempt was made to determine to what extent the set of adopted predictors explains the volatility of the volume of loans for agribusiness Y (Table 5).

Table 4. The level of interest rates of the National Bank of Poland from 08 September 2022 (%)

Depository rate	6.25
Reference rate	6.75
Rediscount rate	6.80
Discount rate	6.85
Lombard rate	7.25

Source: Podstawowe stopy procentowe NBP, NBP, <https://www.nbp.pl/home.aspx?f=/dzienne/stopy.htm> (access: 10.07.2022).

Table 5. Parameters of the influence of the set of model predictors on the dependent variable Y (the volume of loans for agribusiness)

Statistics	Value
Correlation Coefficient (Multiple R)	0.755
Multiple R^2	0.570
Adjusted R^2	0.452

Source: own research.

As a result of multiple regression analysis for the influence of the set of predictors on Y , the level of the correlation coefficient was 0.755 – which confirms the existence of a significant correlation between the volatility of the volume of loans for agribusiness (Y) and the variability of the assumed independent variables. The multiple determination coefficient was adjusted based on the size of the group, and it was found that the model explains at least 45.2% of the variation in Y – which means that there are also other factors influencing the level of credit volume for this sector.

Conclusions

1. In the course of the research, it was found that in the years 2017-2021, the volume of loans for agribusiness entities, including farms, was decisively influenced by such factors as refinancing loan rate (stimulant), rediscount rate (destimulant), and general economic climate in manufacturing index (stimulant).
2. The conducted research was exhaustive and concerned the volume of loans to agribusiness enterprises, including farms in Poland, granted by banks in 2017-2021 during the COVID-19 pandemic. The developed model, in this respect, may be useful *ceteris paribus* to estimate the volume of these loans in the future, especially for production purposes.
3. The results of the conducted research may be used by banks and other institutions to determine the impact of individual explanatory variables on the explained variable. Their changes may be a reason to introduce improvements in the lending policy of banks servicing agriculture in the form of tightening or liberalizing credit requirements. Banks can also use the research results to stimulate or destimulate lending to agribusiness. They can also be used to plan future sales targets and interest income from these loans.
4. It was found, among other things, that there is a relationship between macroeconomic factors and the situation on the market of loans for enterprises from the agribusiness sector. The impact of the general economic situation index may be particularly important as it influenced the change in the actual volume of these loans.
5. There was a cyclical nature of the economic situation in the research period, and selected indicators describing its activity changed along with it. The impact of economic changes on the loan market for agribusiness enterprises, including individual farmers, was confirmed. The obtained research results may be useful for other researchers who want to conduct more detailed analyses in this area. The research results may also be useful for both commercial and cooperative banks, whose interest is the effective prediction of the volume of loans granted to agribusiness enterprises in Poland.

References

- Barro R., Ursúa J., Weng J.: The Coronavirus and the Great Influenza Pandemic: Lessons from the “Spanish Flu” for the Coronavirus’s Potential Effects on Mortality and Economic Activity, 26866/2020, p. 10-15, https://www.nber.org/system/files/working_papers/w26866/w26866.pdf (access: 10.07.2022).
- Beck R., Jakubik P., Piloju A.: Key Determinants of Non-performing Loans: New Evidence from a Global Sample, *Open Economies Review*, 26 (3)/2015, p. 525-550.
- Berger A., Demsetz R., Strahan P.: The consolidation of the financial services industry: Causes, consequences, and implications for the future, *Journal of Banking and Finance*, 23/1999, p. 135-194.
- Bierlen R., Barry P.J., Dixon B.L., Ahrendsen B.L.: Credit constraints, farm characteristics

- and the farm economy: Differential impact on feeder cattle and beef cow inventories, *American Journal of Agricultural Economics* 80 (4)/1998, p. 708-723.
- Cheng C., Barceló J., Hartnett A.S., Kubinec R., Messerschmidt L.: COVID-19 Government Response Event Dataset (CoronaNet v.1.0), *Nature Human Behaviour*, 4 (7)/2020, p. 756-768.
- Czerwińska-Kayzer D., Poczta W.: Preferential loan as an instrument of structural changes in agriculture, *Więś i Rolnictwo*, 3 (112)/2001, p. 99-113.
- Dias A.L., Manuel E.C., Dutschke G., Pereira R., Pereira L.: Economic crisis effects on SME dynamic capabilities, *International Journal of Learning and Change*, 13 (1)/2021, p. 63-80.
- Falagiarda M., Prapiestis A., Rancoita E.: Public loan guarantees and bank lending in the COVID-19 period, *Economic Bulletin Boxes*, 6/2020, p. 112-148.
- Felczak T.: Sources of financing the activities of individual farms in the opinion of managers). *Zeszyty Naukowe Uniwersytetu Szczecińskiego, Finanse, Rynki Finansowe, Ubezpieczenia*, 74 (2)/2015, p. 83-01.
- Grzegorzewska E.: Indebtedness of agricultural enterprises in Poland in the face of the global economic crisis, *Zeszyty Naukowe SGGW. Polityki Europejskie, Finanse i Marketing*, 10 (59)/2013, p. 268-276.
- Hübner D., Lubiński M., Małecki W., Matkowski Z.: *Koniunktura gospodarcza*. PWE, Warszawa 1994.
- Józwiak W.: Ocena efektów kredytowania preferencyjnego w gospodarstwach osób fizycznych, *Zagadnienia Ekonomiki Rolnej* 4-5/1999, p. 13-26.
- Juszczyk S., Balina R.: NBP interest rates and lending to non-financial enterprises, *Bank, Miesięcznik Finansowy* 2/2017, <https://alebank.pl/nauka-stopy-procentowe-nbp-akcja-kredytowa-dla-przedsiębiorstw-niefinansowych/?id=224675&catid=960> (access: 10.07.2022).
- Kata R.: Endogeniczne i instytucjonalne czynniki kształtujące powiązania finansowe gospodarstw rolnych z bankami, *Oficyna Wydawnicza Politechniki Rzeszowskiej, Rzeszów* 2011.
- Kata R.: Premises and microeconomic determinants of using bank loans by farmers, *Roczniki Ekonomiczne Kujawsko-Pomorskiej Szkoły Wyższej w Bydgoszczy*, 5/2012, p. 241-260.
- Kulawik J.: Lending and financing agriculture on the eve of integration with the European Union, *Bank i Kredyt*, 6/2003, p. 29-42.
- Mikołajczyk P.: Krótkoterminowe kredyty bankowe dla przedsiębiorstw w warunkach kryzysu finansowego, *Nauki o Finansach*, 2/2014, p. 423-430.
- Podstawowe stopy procentowe NBP, NBP, <https://www.nbp.pl/home.aspx?f=/dzienne/stopy.htm> (access: 10.07.2022).
- Rosa A.: Farmers of Central Pomerania in the banking services market, [in:] D. Zawadzka, J. Sobiech (eds), *Growth and allocation of financial and tangible assets of farmers (agricultural enterprises and households) in Central Pomerania*, Publishing House of the Koszalin University of Technology, Koszalin 2014, p. 229-260.
- Szybki Monitoring NBP, NBP, https://www.nbp.pl/home.aspx?c=/ascx/koniunktura_prezentacja.ascx (access: 10.07.2022).
- Wasilewski M., Felczak T.: 2013. Efektywność strategii płynności finansowej w gospodarstwach rolniczych o zróżnicowanej sile ekonomicznej, *Zarządzanie*

i *Finanse*, 2 (2)/2013, p. 491-501.
Wąsiński M., Wnukowski D.: Skutki pandemii COVID-19 dla gospodarki światowej,
Biuletyn Polskiego Instytutu Spraw Międzynarodowych, 84/2020, p. 1-2.

Czynniki makroekonomiczne jako narzędzia zwiększania lub zmniejszania kredytów dla agrobiznesu w sytuacjach kryzysowych

Streszczenie

Celem niniejszego artykułu było podjęcie próby identyfikacji zmian na rynku kredytów dla przedsiębiorstw agrobiznesu, w tym gospodarstw rolnych w Polsce, w okresie pandemii COVID-19. W badaniu wykorzystano dane Głównego Urzędu Statystycznego i Biura Informacji Kredytowej za lata 2017-2021. W toku badań m.in. skonstruowano model ekonometryczny objaśniający wielkość kredytów udzielonych wyżej wymienionym podmiotom przez banki komercyjne i spółdzielcze w Polsce w czasie pandemii. Wykorzystano program Statistica 13.3. Badaniami objęto wszystkie kredyty udzielone w Polsce w/w podmiotom w szeregach miesięcznych w latach 2017-2021. W tym okresie banki udzieliły rolnikom indywidualnym łącznie 307 012 kredytów, a ich wolumen wyniósł prawie 30 mld zł. W toku badań stwierdzono m.in., że na wielkość tych kredytów decydujący wpływ miały takie czynniki, jak: stopa kredytu refinansowego (stymulanta), stopa redyskonta weksli (destymulanta) oraz poziom wskaźnika ogólnego klimatu gospodarczego w przetwórstwie przemysłowym (stymulanta). Zbiór zmiennych objaśniających w modelach może stanowić przesłankę do wprowadzania określonych usprawnień w polityce kredytowej banków obsługujących agrobiznes w postaci zaostrzania lub liberalizowania wymogów kredytowych. Wyniki badań mogą być również wykorzystywane przez banki do skuteczniejszego planowania przyszłych celów sprzedażowych i przychodów odsetkowych z tych kredytów.

Słowa kluczowe: przedsiębiorstwa agrobiznesu, wolumen kredytów dla agrobiznesu, pandemia COVID-19

Kody JEL: G21, G23, G24, G28

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OPERATING SURPLUS OF LGUS IN THE CONTEXT OF LEGAL CHANGES RESULTING IN A DECLINE OF LGUS' CURRENT INCOME FROM PIT

The issue of an operating surplus of local government units (LGUs) is gaining significance due to, inter alia, the enactment of legal changes resulting in a decline in the current income of LGUs from PIT. The purpose of the research is evaluation of the development of the LGUs' operating surplus in the context of legal changes (enacted in 2019-2022) causing the said decline as well as the evaluation of the mechanisms compensating LGUs for that decline. The following were applied to accomplish the research objective: (1) quantitative analysis, taking into consideration the data of the Ministry of Finance presented in the reports on LGUs' budget implementation for 2020-2021 and multi-annual financial forecasts for the LGUs' budget plan for 2022; (2) review of source literature and legislation related to the research subject.

The analysis performed for the years 2020-2022 shows that the period of growth in the value of the operating surplus in all types of LGUs in 2021 in comparison to 2020 is followed by a significant decline in its value in 2022 (as planned). Across Poland, this applies to: municipalities, cities with county rights and voivodeships. Whereas, in the case of counties (on a Poland-wide scale), no operating surplus has been planned at all for 2022. The above situation may result not only in a decline in the capacity to finance investments from the operating surplus in LGUs, but also in the differentiation of these capacities within specific LGU types. Increased differentiation of this phenomenon in specific local governments may be affected by, inter alia, the adopted system of criteria of distribution of funds as part of the compensation for the decline in current income from PIT (especially in the development part of the general subsidy).

Keywords: finance, operating surplus, LGU, PIT, compensation mechanism

JEL Codes: G38, H72, H61, H41

Introduction

The issue of an operating surplus of local government units (LGUs) is gaining significance, both in cognitive and application terms. The gravity of this issue in the area of local government finance is additionally emphasised by the fact of enactment of legal changes resulting in LGUs' recording a decline in their current income on inflows from personal income tax (PIT). Particularly important changes in this scope include enactment in:

1. 2019 of the reduction of the PIT rate from 18 to 17%, an increase of the tax-deductible amount, PIT exemption for persons below the age of 26 (Act of 30 August 2019 – consolidated text: Journal of Laws, item 1387, as amended)¹; which caused a decline in the LGUs' income from PIT by PLN 6.1 billion²;

¹ Ustawa z dnia 30 sierpnia 2019 r. o zmianie ustawy o podatku dochodowym od osób fizycznych oraz ustawy o zmianie ustawy o podatku dochodowym od osób fizycznych oraz niektórych innych ustaw, Dz.U., poz. 1387, as amend.

² Samorządy odcięte od dochodów z PIT. Proponują rozwiązanie, Rzeczpospolita, 18.04.2022, <https://regiony.rp.pl/podatki/art36096791-samorzady-odciete-od-dochodow-z-pit-proponuja-rozwiazanie> (access: 18.04.2022).

2. 2021 of the Polish Deal regulations through: an increase (to PLN 30 thousand) of the non-taxable amount; an increase of the tax threshold from PLN 85 thousand to PLN 120 thousand; introduction of zero PIT for persons working upon attainment of the retirement age (up to the value of the tax threshold); introduction of the correction factor (higher tax-deductible expenses) for the persons earning from PLN 6 thousand to PLN 10.5 thousand (Act of 29 October 2021 – Journal of Laws of 2021, item 2105)³; which causes, according to the estimates of the Ministry of Finance, a decline in the LGUs' income in 2022 amounting to PLN 11 922 million, and over 10 years – PLN 112 426 million (for fixed prices of 2022 – Evaluation of effects of regulations of 07.09.2021)⁴;
3. 2022 of the reduction of, *inter alia*, the PIT tax rate applied in the first range of the progressive scale from 17% to 12% (Act of 9 June 2022 – Journal of Laws of 2022, item 1265)⁵.

The value of the current income of LGUs (including inflows from PIT) is a significant determinant of the formation of the LGUs' operating surplus. Any decline in this category of income may, therefore, affect the ultimate value of the operating surplus of LGUs. This issue has not been subject to many analyses in the currently available source literature.

The discussion focused mostly on the issues regarding:

- the role of the operating surplus in the context of investment activities of LGUs⁶;
- the significance of the operating surplus in the budget of selected types of LGUs on the example of selected voivodeship⁷;
- the analysis of the operating surplus in the context of LGUs' financial decisions⁸.

Therefore, the proposed research subject may contribute to the partial filling of the research gap in the scope of analyses regarding the LGUs' operating surplus.

Research methodology

The purpose of the research is evaluation of the development of the LGUs' operating surplus in the context of legal changes (enacted in 2019-2022) causing a decline in the LGUs' current income on inflows from PIT. The formula of the said objective also incorporates an evaluation of the mechanisms compensating the LGUs for the decline in the current income from PIT (one-time supplementation of the general subsidy and introduction of the development part of the general subsidy) significant in the formation of the LGUs' operating surplus. The research period adopted for the purpose of evaluating the formation

³ Ustawa z dnia 29 października 2021 r. o zmianie ustawy o podatku dochodowym od osób fizycznych, ustawy o podatku dochodowym od osób prawnych oraz niektórych innych ustaw, Dz.U. z 2021 r., poz. 2105.

⁴ Ocena skutków regulacji z dnia 07.09.2021 r. do projektu ustawy o zmianie ustawy o podatku dochodowym od osób fizycznych, ustawy o podatku dochodowym od osób prawnych oraz niektórych innych ustaw. Nr w wykazie prac legislacyjnych Rady Ministrów: UD260, p. 562-563

⁵ Ustawa z dnia 9 czerwca 2022 r. o zmianie ustawy o podatku dochodowym od osób fizycznych oraz niektórych innych ustaw, Dz.U. z 2022 r., poz. 1265.

⁶ E. Gubernat: Zdolności inwestycyjne jednostek samorządu terytorialnego województwa dolnośląskiego w latach 2007-2013, *Finanse, Rynki Finansowe, Ubezpieczenia*, 6 (84)/2016, p. 71-83; P. Galiński: Możliwości finansowania inwestycji przez gminy w Polsce w latach 2010-2012, *Zeszyty Naukowe Uniwersytetu Szczecińskiego nr 802 Finanse, Rynki Finansowe, Ubezpieczenia*, 65/2014, p. 71-82.

⁷ A. Krzemińska: Znaczenie nadwyżki operacyjnej w budżecie gmin i miast na prawach powiatu na przykładzie województwa wielkopolskiego i lubelskiego, *Optimum. Economic Studies*, 2 (92)/2018, p. 61-67.

⁸ M. Dylewski: Nadwyżka operacyjna a decyzje finansowe jednostek samorządu terytorialnego, *Annales Universitatis Mariae Curie-Skłodowska Lublin. Sectio H*, 51, 6/2017, p. 75-84.

of the LGUs' operating surplus covers the years 2020-2022. The following were applied to accomplish the research objective:

- quantitative analysis, taking into consideration secondary data originating from:
 - Ministry of Finance, reports: Rb-27S, Rb-28S (regarding LGUs' budget implementation for 2020-2021);
 - multi-annual financial forecasts (MAFF) as of 31.01.2022 (regards the plan for 2022).
- review of source literature in the scope of LGUs' operating surplus and legislation related to the research subject.

The collected analytical data were grouped by specific types of LGUs: municipalities, counties and voivodeships. The classification also distinguished cities with county rights whose budget planning and implementation include funds for the performance of public tasks both in the municipality and county-related part.

The analyses were carried out from a normative perspective, which enabled the determination of conditions required to design new solutions in the area of finance⁹.

Significance of the LGUs' operating surplus

The science of public finance assumes that the operating surplus in LGUs is the positive difference between the current income and current expenses¹⁰. On the other, the term of current income and current expenses of LGUs are defined indirectly in the content of Article 235(2)-(3) and Article 236(2) and (4) of the Act on Public Finance of 27 August 2009 (consolidated text: Journal of Laws of 2022, item 1634)¹¹. The LGUs' budgetary current income has been included as budgetary income other than financial income, which includes:

- subsidies and funds allocated to investments,
- income on the sale of property,
- income on the transformation of the perpetual usufruct right into the ownership right.

On the other hand, LGUs' budgetary current expenses are provided for in the Act as budgetary expenses other than financial expenses, which include expenses on:

- investments and investment purchases (including programmes financed with the participation of EU budget funds or non-refundable funds from aid granted by the member states of the European Free Trade Association (EFTA) or non-refundable funds from other foreign sources, in the part related to the performance of tasks of the local government units);
- acquisition and subscription for shares;
- making contributions to commercial companies.

Analysing the issue of the operating surplus, one must, however, remember that under Article 242(1) of the quoted Act on Public Finance of 2009, the LGUs' governing authority cannot adopt a budget where the planned current expenses exceed the planned current income plus the operating surplus from prior years and free cash.

⁹ S. Owsiak: *Finanse*, PWE, Warszawa 2015, p. 86.

¹⁰ *Nadwyżka operacyjna w jednostkach samorządu terytorialnego w latach 2008-2010*, Ministerstwo Finansów, Warszawa 2010, p. 3.

¹¹ Ustawa z dnia 27 sierpnia 2009 r. o finansach publicznych, Dz.U. z 2022 r. poz. 1634.

Under Article 121 of the Act of 27 August 2009 – Regulations Implementing the Act on Public Finance (Journal of Laws No. 157, item 1241)¹², the relation resulting from the discussed Article 242 applied for the first time to the LGUs' budget resolutions adopted for 2011.

The obligation to balance the LGUs' operating budget applies both to its planning and implementation stage. Nevertheless, it must be emphasised that in the case of the performance of current tasks with the use of EU funds, current expenses can exceed current income plus the operating surplus from prior years and cash only by the amount connected with the performance of current tasks with the use of the funds:

- originating from the budget of the European Union;
- and non-refundable funds from aid granted by the member states of the European Free Trade Association (EFTA) if such funds are not provided in the current budget year.

An important argument supporting budget balancing and referring to its current part is the limitation of non-productive debt as an increase in indebtedness for the purpose of financing current expenses may, in consequence, lead to the need to contract further debts to repay previous liabilities (the so-called debt trap)¹³.

The operating surplus is one of the most important ratios for the evaluation of the LGUs' financing standing in the scope of determining if it is capable of covering its current expenses with current income. If current income exceeds current expenses, LGUs have the financial capacity to develop new investments or repay previously contracted debts (repayment of instalments of loans, borrowings or issued bonds). The higher the operating surplus, the higher the LGUs' capability to develop new investments, both directly, by allocation of that amount to investments, and indirectly – by repayment of liabilities contracted for that purpose. Thus, it must be assumed that if the LGU has an operating surplus, it has funds at its disposal that can be allocated directly to investments in improving the level of prosperity of the local community. It must be added that the operating surplus is an attractive source of investment financing for LGUs. It is so, as for other sources of investment financing (financial income, loans and borrowings), the local government would have to carry out an analysis to:

1. Determine its capability of obtaining financial income. This income category is irregular in nature. Such types of income are incidental, but it may happen that they will support the local government's budget for several years. In principle, its role comes down to financing tasks performed over a time horizon exceeding one year, with their effects also used in a long-term perspective¹⁴.

¹² Ustawa z dnia 27 sierpnia 2009 r. Przepisy wprowadzające ustawę o finansach publicznych, Dz.U. nr 157, poz. 1241.

¹³ B. Dafflon: Theory of Subnational Balanced Budget and Debt Control, [in:] B. Dafflon (ed.), Local Public Finance in Europe: Balancing the Budget and Controlling Debt, Edward Elgar, Cheltenham, UK & Northampton, MA, USA 2002, p. 15-44; P. Swianiewicz: Finanse lokalne – teoria i praktyka, Municipium, Warszawa 2004, p. 32-37, 131-139; M. Poniatowicz, J.M. Salachna, D. Perło: Efektywne zarządzanie długiem w jednostce samorządu terytorialnego, Wolters Kluwer, Warszawa 2010, p. 19-36, 48-59.

¹⁴ A. Sekuła: Kształtowanie się dochodów majątkowych jednostek samorządu terytorialnego w latach 2007-2008, [in:] R. Broła (ed.), Gospodarka lokalna w teorii i praktyce, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, 109/2010, p. 252.

2. Assess the availability and cost of obtaining capital¹⁵. In the case of loans and borrowings, the restrictions in the form of local government indebtedness limits resulting from Article 243 of the quoted Act on Public Finance of 2009 must be taken into consideration¹⁶.

If no operating surplus is generated, the scale of satisfaction of investment needs of the given LGU would either have to be reduced or a decision on the sale of the local government's property or on borrowing money from the market to implement the originally assumed investment plans would have to be made.

Although the operating surplus in the LGUs' budget is treated as a positive phenomenon, one must consider that:

- the operating surplus does not include financial income/expenses, and these categories are important for the LGUs' financial economy;
- the operating surplus in the LGUs' budget does not include the inflow-outflow side of the budget, i.e. the current income does not include inflows obtained by the units from borrowings or bank loans or surpluses from prior years and funds obtained from the privatisation of LGUs' property (inflows), while the current expenses do not include amounts spent on repayment of contracted loans and borrowings (outflows);
- when assessing the financial standing of LGUs, there are limitations resulting from the presentation of the budget on a cash basis, i.e. recognising actual payments made in the budget year as income and expenses, irrespective of the period they regard and when they mature¹⁷.

Formation of the operating surplus of LGUs in 2020-2022

The analysis of the formation of the operating surplus of LGUs should be preceded by an evaluation of the formation of its two analytical determinants, i.e. current income and expenses. Table 1 presents data regarding LGUs' current income in 2020-2022.

Table 1. LGUs' current income in 2020-2022

LGU type	LGUs' current income in		
	2020 (implemented)	2021 (implemented)	2022 (planned)
Municipalities	133 619 796 689.70	145 987 572 928.51	122 649 208 539.35
Cities with county rights	91 582 953 491.16	103 196 567 513.33	90 548 348 857.81
Counties	29 738 424 840.51	32 457 779 233.66	30 218 053 589.92
Voivodeships	16 931 949 840.23	19 091 496 970.64	20 455 934 312.32

Source: own study based on data from the Ministry of Finance.

Comparing the year 2021 to the year 2022, one can note an increase in current income in all types of LGUs in Poland. This increase may be partially explained by the award of compensation for the decline in income from PIT to LGUs in December 2021 in the form of the one-time supplementation of the general subsidy in the amount of PLN 8 million

¹⁵ M. Ziolo: Zewnętrzne, obce źródła finansowania wydatków inwestycyjnych gmin i determinanty ich doboru, *Zeszyty Naukowe, Polskie Towarzystwo Ekonomiczne*, 10/2011, p. 289-298.

¹⁶ J. Zawora, P. Zawora: Możliwości finansowania działalności inwestycyjnej przez gminy województwa podkarpackiego, *Ekonomiczne Problemy Usług*, 4, (129)/2017, p. 282.

¹⁷ M. Wiewióra: Nadwyżka finansowa a samorząd, *Serwis Samorządowy PAP*, 2008, <https://samorzad.pap.pl/kategoria/archiwum/nadwyzka-finansowa-samorzad> (access: 15.05.2022).

(on a Poland-wide scale). On the other hand, comparing the year 2022 (without compensation payment) to 2021, one may note a planned decline in the value of current income by 16% for municipalities, by 12% for cities with county rights and by 7% for counties. Only at the level of voivodeships an increase in current income is planned – 0.7% in comparison to 2021. Additionally, if we look at the inflows from PIT to the current income of LGUs in the analysed period, these inflows are planned for 2022 at a level lower than in 2021 for all types of LGUs; this, however, does not translate into the value of the share of PIT in the current income of LGUs (on a Poland-wide scale) (cf. Table 2).

Analysing the current expenses of LGUs in 2020-2022, one may draw similar conclusions as in the analysis of the current income of LGUs (see Table 3). Comparing the year 2021 to the year 2022, one can note an increase in current expenses in all types of LGUs in Poland. On the other hand, comparing the year 2022 to 2021, one may note a planned decline in the value of current expenses by 6% for municipalities and by 3% for counties. Whereas, as regards counties and voivodeships, an increase in current expenses is planned by 6 and 21%, respectively, in comparison to 2021.

Table 2. Inflows from personal income tax (PIT) in LGUs' budgets in 2020-2022

LGU type	Inflows from PIT in					
	2020 (implemented)		2021 (implemented)		2022 (planned)	
	PIT	%*	PIT	%*	PIT	%*
Municipalities	22 980 318 967.00	17	25 885 024 490.00	18	22 527 077 204.40	18
Cities with county rights	24 162 402 264.00	26	27 272 768 439.00	26	23 715 074 051.00	26
Counties	6 172 761 296.00	21	6 940 195 025.00	21	6 017 699 643.23	20
Voivodeship	1762 132 061.00	10	1 983 431 946.00	10	1 720 495 999.00	8

* share of inflows from PIT in the current income of LGUs.

Source: own study based on data from the Ministry of Finance.

Table 3. LGUs' current expenses in 2020-2022

LGU type	LGUs' current expenses in		
	2020 (implemented)	2021 (implemented)	2022 (planned)
Municipalities	122 464 654 796.77	129 536 091 400.97	122 335 436 290.81
Cities with county rights	88 276 158 152.92	92 555 291 956.79	90 224 528 161.92
Counties	27 027 899 180.88	28 745 052 835.84	30 473 036 211.19
Voivodeships	12 720 096 881.02	13 290 654 199.97	16 134 833 758.59

Source: Own study based on data from the Ministry of Finance.

A comparison of the above two analytical determinants for the years 2020 and 2022 shows that the LGUs' operating surplus (on a Poland-wide scale) was characterised by variable values (cf. Table 4).

Table 4. Operating surplus of LGUs in 2020 – 2022

LGU type	Operating surplus of LGUs in		
	2020 (implemented)	2021 (implemented)	2022 (planned)
Municipalities	11 155 141 892.93	16 451 481 527.54	313 772 248.54
LGU type	Operating surplus of LGUs in		
	2020 (implemented)	2021 (implemented)	2022 (planned)
Cities with county rights	3 306 795 338.24	10 641 275 556.54	323 820 695.89
Counties	2 710 525 659.63	3 712 726 397.82	-254 982 621.27
Voivodeships	4 211 852 959.21	5 800 842 770.67	4 321 100 553.73

Source: Own study based on data from the Ministry of Finance.

Comparing the year 2021 to 2020, there is an increase in the value of the operating surplus in all types of LGUs, with the highest – over three times – increase recorded for cities with county rights. On the other hand, data for 2022 is completely different in this regard. The plans for 2022 provide for an operating surplus for municipalities, cities with county rights and voivodeships, but lower than in 2022 (lower by: 98, 97 and 26%, respectively).

On the other hand, as regards counties, no operating surplus is planned at all. This situation results in the noted decline in the share of the operating surplus in the total income of LGUs in 2022 in comparison to 2021 for:

- municipalities and cities with county rights: from 10 to 0%,
- voivodeships: from 25 to 17%,
- counties: from 10% to negative values.

To summarise, the operating surplus of LGUs in the analysed year on a Poland-wide scale looks the least favourable in 2022. This situation could have been affected by, *inter alia*, the lack of payment of compensations for LGUs in connection with the decline in current income in the part of inflows from PIT in the years 2021-2022. However, it must be emphasised that the formation of the operating surplus in individual local government units may be characterised by an even greater degree of differentiation in value than the degree resulting from the data presented on an aggregate basis for LGUs. This situation may be affected by the criteria for the distribution of funds in the mechanisms compensating LGUs for the decline in PIT.

Mechanisms compensating the decline in LGUs' current income vs formation of the LGUs' operating surplus

The mechanisms compensating for the decline in LGUs' current income are important for the ultimate formation of the operating surplus, as the value of current income is the key determinant in generating the operating surplus by LGUs. The Act Amending the Act on Income of Local Government Units and Certain Other Acts of 14 October 2021 (Journal of Laws of 2021, items 1927, 2427)¹⁸ provides for mechanisms compensating the decline in the current income of LGUs in the form of an obligatory payment of:

- one-time supplementation of the general subsidy for LGUs in 2021 amounting to PLN 8 billion;
- new development part of the general subsidy for LGUs.

¹⁸ Ustawa z dnia 14 października 2021 r. o zmianie ustawy o dochodach jednostek samorządu terytorialnego oraz niektórych innych ustaw, Dz.U. poz. 1927.

The very fact of choice of the subsidy transfer for the compensation of LGUs' decline in income may be assessed positively in some aspects. The supporting arguments include:

- linking this type of transfer in the financial policy of the state with the principles of subsidiarity and adequacy (stipulated both in the Constitution of the Republic of Poland and in the treaty documents of the European Union)¹⁹;
- generality of this type of transfer, enabling freedom of management of these funds by LGUs (Article 7 of the Act on Income of Local Government Units of 13 November 2003) – consolidated text: Journal of Laws of 2021, item 1672, as amended)²⁰.

A significantly more important issue for the ultimate formation of the operating surplus is the method of distribution of funds from the general subsidy among LGUs under the PIT decline compensation mechanism. Therefore, in the case of one-time supplementation of the general subsidy, the following must be noted:

1. Inadequacy of the value of the compensation in relation to the value of decline in the income of LGUs estimated in 2022 as amounting to PLN 11,922 million (Evaluation of effects of regulations – Polish Deal).
2. Adjustment of the value of the amount due to the LGU after its initial calculation according to the following principle: proportionally to the value of the share of income planned for 2022 on the share in PIT inflows of municipalities, counties and voivodeships in the total amount of income of all LGUs on that account. The subsidy is adjusted taking into consideration a ratio calculated with use – for example, for municipalities – of, *inter alia*, income on the compensatory and balancing parts of the general subsidy planned for 2022, for 2022, minus payments to the state budget planned for 2022. Additionally, LGUs have been assigned ranges of reference to the total value of funds due to the specific types of LGUs (for municipalities, this amount cannot be lower than 0.005% and cannot be higher than 5% of the total amount of funds; for counties: not lower than 0.025% and not higher than 10%; for voivodeships: not lower than 2.5% and not higher than 15%).

As a result, a mechanism unproportional to the value of the decline in PIT income in individual LGUs was created. Considering the upper reference limit for the group of municipalities and cities with county rights (municipal part) – the limit covered Warsaw, while in the group of voivodeships – Silesian Voivodeship²¹. This means the differentiation of the situation of LGUs in terms of supplementation of the decline in PIT income with the one-time supplementation of the general subsidy for LGUs. Therefore, the formation of current income from the part regarding inflows from PIT with a concurrent lack of supplementation from other sources of current income will result in a declining value of the operating surplus for LGUs.

The second analysed mechanism compensating for the decline in LGUs' current income on PIT – the development part of the general subsidy – is characterised by quite

¹⁹ J. Szołno-Koguc: Subwencja ogólna jako instrument wsparcia transferowego samorządu gminnego, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, 485/2017, p. 463.

²⁰ Ustawa z dnia 13 listopada 2003 r o dochodach jednostek samorządu terytorialnego, Dz.U. z 2021 r. poz. 1672 as amend.

²¹ M. Czekaj: Panel: Zmiany w finansowaniu jednostek samorządu terytorialnego, XIII Międzynarodowe Forum Finansowo-Bankowe: Wyzwania współczesnych finansów – ryzyka, strategię, perspektywy, Warszawa 2021.

a complex structure of distribution of funds among the LGUs. These funds are divided into:

- The primary amount determined proportionally to the number of LGUs' residents, with the determination of lower and upper limits of amounts for:
 - municipalities: amount not lower than 0.01% and not higher than 3% of the primary amount determined for all municipalities;
 - counties: amount not lower than 0.1% and not higher than 0.95% of the primary amount determined for all counties;
 - voivodeships: amount not lower than 3% and not higher than 10% of the primary amount determined for all voivodeships.
- Activation bonus – granted to a municipality, county and voivodeship with dynamics of financial expenses, excluding financial expenses from budget subsidies granted by other local government units, in the year preceding the base year in relation to its preceding year, as converted per 1 resident, exceeding the analogous ratio for all municipalities, counties and voivodeships. The bonus will be divided proportionally to the financial expenses of the entitled municipalities, counties and voivodeships, respectively, and determined per 1 resident.
- Investment bonus – granted to a municipality, county and voivodeship with a ratio of financial expenses per 1 resident in the year preceding the base year exceeding the analogous ratio for all municipalities, counties and voivodeships. The investment bonus will be divided proportionally to the financial expenses of the entitled municipalities, counties and voivodeships, respectively, and determined per 1 resident.

Inclusion of the following in the structure of the development of the general subsidy structure:

- two components promoting LGUs' financial expenses (as converted per 1 resident according to the status as of 2021);
- upper and lower limits of amounts for the primary part of the development subsidy for the specific types of LGUs;

can cause the following effects in certain LGUs:

- discriminatory effect (due to the compensation, LGUs will receive fewer funds than they lost),
- "bonus effect" (due to the compensation, LGUs will receive more funds than they lost).

The above effects can be observed using the example of 10 municipalities and counties losing and gaining the most due to the compensation mechanism in the form of the development part of the general subsidy (cf. Tables 5-6).

The quoted report on the effectiveness of compensation for the decline in income from PIT with the development part of the general subsidy shows that 1837 municipalities gained funds exceeding their estimated loss of inflows from PIT. In certain municipalities, these funds are significantly higher – even 20 times higher than the incurred loss. On the other hand, 640 municipalities will not record income compensation. Therefore, it may be stated that more municipalities will gain than lose on the effective structure of the development part of the general subsidy. An analogous phenomenon in the scope of estimation and lack of compensation of funds is recorded for counties.

Table 5. Municipalities losing and gaining the most on the compensation of losses from PIT with the development part of the general subsidy

Municipalities losing the most in percentage terms	Ratio (%)	Municipalities gaining the most in percentage terms	Ratio (%)
m. st. Warszawa (część gminna)	-84.28	Palecznica	4128.70
Konstancin-Jeziorna	-81.15	Jaślicka	3956.34
Stare Babice	-77.48	Krempna	3551.09
Puszczykowo	-75.75	Wiżajny	3015.06
Milanówek	-70.66	Perlejewo	2878.63
Lesznówola	-68.90	Kozielice	2726.68
Piaseczno	-66.15	Powidz	2553.05
Zielonka	-63.40	Milejczyce	2468.94
Mogilany	-63.22	Dębowa Łąka	2217.48
Józefów	-62.53	Młynarze	2177.85

Source: G.P. Kubalski, J.M. Czajkowski: Skuteczność rekompensowania ubytku dochodów z udziału PIT przez część rozwojową subwencji ogólnej, Analizy samorządowe, 18/2022, p. 8-9.

In the case of counties, 232 units gain on the compensation mechanism with development subsidy, and 148 lose on it. It is another case where counties “gaining” on the development part of the general subsidy outnumber those “losing” on that subsidy. In particular, it must be emphasised that the group of counties “losing” almost half of the funds are cities with county rights. In principle, these units, in the part assigned to counties, receive fewer funds in the development subsidy than they lost from PIT.

Table 6. Counties losing and gaining the most on the compensation of losses from PIT with the development part of the general subsidy

Counties losing the most in percentage terms	Ratio (%)	Counties gaining the most in percentage terms	Ratio (%)
Warszawa (district part)	-95.06	bieszczadzki	1635.62
Kraków (district part)	-76.86	sejneński	1574.41
Łódź (district part)	-73.70	Świnoujście	1535.94
Wrocław (district part)	-71.77	przysuski	870.63
piaseczyński	-69.31	węgorzewski	857.04
warszawski zachodni	-68.21	kolneński	803.84
Gdańsk (district part)	-67.38	chełmski	784.27
Poznań (district part)	-64.20	suwalski	752.77
chojnicki	-56.28	sztumski	735.51
Gdynia (district part)	-53.03	makowski	633.30

Source: G.P. Kubalski, J.M. Czajkowski: Skuteczność rekompensowania ubytku dochodów z udziału PIT przez część rozwojową subwencji ogólnej. Analizy samorządowe, 18/2022, p. 10-11.

The above local government analyses may give rise to certain observations in the scope of the ultimate formation of the LGUs’ operating surplus in the conditions of decline in current income from PIT. Assuming that LGUs’ current income other than PIT will not show a declining tendency in the budget inflows of LGUs, the funds from the development subsidy may cause an effect in the form of an increase or decline in the value of LGUs’ current income in comparison to the status from before the implementation of the legal changes regarding the decline in PIT inflows. In the case of LGUs without compensation for the decline in current income from PIT, the possible scenario is that the generated operating surplus will be lower or will not be generated at all. On the other hand, in the case of LGUs with compensation, the value of which exceeds the decline in PIT inflows, a higher operating surplus in comparison to the status from before the implementation of

legal changes regarding the decline in PIT should be expected. It must be emphasised that the above scenarios would be more real in the case of a lack of leap-like increases in the current expenses of LGUs. However, the actual increase in LGUs' current expenses may be affected by:

- high inflation in Poland;
- increase in costs of performance of public tasks in Poland in the conditions of aggravating civilisation issues, including the following threats:
 - environmental threats connected with the emission of greenhouse gases and chemical substances harmful to the ozone layer²², the consequences of which affect humanity in the form of diseases, malnutrition, premature deaths or accidents²³;
 - demographic threats connected with depopulation phenomena cause a decline in the consumption potential and, subsequently, a decline in demand for employment and – in the target structure – an increase in costs of public services²⁴;
 - socio-economic threats regarding, *inter alia*, unemployment, poverty, social pathology, breakdown of social and family ties, and economic migration (Resolution No. 8 of the Council of Ministers of 14 February 2017 on the adoption of the Strategy for Responsible Development until 2020 (with perspective to 2030) and support of political/war refugees²⁵).

It must be added that the mechanisms supporting the income side of the LGUs' budget proposed in the analysed research period also included the Strategic Investment Programme (Act on Amendment of the Act on Special Solutions Connected with Prevention, Counteracting and Combating COVID-19, Other Contagious Diseases and Resulting Crisis Situations and Certain Other Acts of 31 September 2020 – Journal of Laws, item 568, as amended)²⁶; Resolution No. 84/2021 of the Council of Ministers of 1 July 2021)²⁷. However, this mechanism of support has been disregarded in the discussion concerning the formation of the LGUs' operating surplus as this Programme regards the LGUs' capability of obtaining funds for the development of investments, i.e. financial income. Under Article 235 of the quoted Act on Public Finance of 2009, this group of LGUs' income includes, without limitation, subsidies and funds allocated to investments²⁸. This type of support for LGUs is, therefore, not related directly to generated of the operating surplus and does not amplify the principle of financial independence of LGUs, i.e. transferring adequate funds and authority to dispose of them independently to LGUs²⁹.

²² W. Nordhaus: Reflection on the Economics of Climate Change, *Journal of Economic Perspectives*, 7, 4/1993, p. 11-25.

²³ Polityka ekologiczna państwa 2030. Raport, Ministerstwo Środowiska, Warszawa 2018, p. 39-44.

²⁴ Prognoza ludności na lata 2014-2050, GUS, Warszawa 2014, p. 114 et seq.

²⁵ Uchwała nr 8 Rady Ministrów z dnia 14 lutego 2017 r. w sprawie przyjęcia Strategii na rzecz Odpowiedzialnego Rozwoju do roku 2020 (z perspektywą do 2030 r.), *Monitor Polski* z 2017 r. poz. 260.

²⁶ Ustawa z dnia 31 marca 2020 r. o zmianie ustawy o szczególnych rozwiązaniach związanych z zapobieganiem, przeciwdziałaniem i zwalczaniem COVID-19, innych chorób zakaźnych oraz wywołanych nimi sytuacji kryzysowych oraz niektórych innych ustaw, *Dz.U.* poz. 568, as amend.)

²⁷ Uchwała nr 84/2021 Rady Ministrów z dnia 1 lipca 2021 r. w sprawie ustanowienia Rządowego Funduszu Polski Ład: Programu Inwestycji Strategicznych, RM-06111-84-21.

²⁸ P. Sołtyk, M. Dębowska-Sołtyk: *Finanse samorządowe*, Difin, Warszawa 2006, p. 64.

²⁹ N. Devas, M. Alam, S. Deley, R.O. Koranteng, P. Venkatachalam: *Financing Local Government*, Commonwealth Secretariat, London 2008, p. 11.

Conclusion

The analysis performed for the years 2020-2022 shows that the period of growth in the value of the operating surplus in all types of LGUs in 2021 in comparison to 2020 is followed by a significant decline in its value in 2022 (as planned). Across Poland, this applies to: municipalities, cities with county rights and voivodeships. Whereas, on the Poland-wide scale, in the case of counties, no operating surplus has been planned at all for 2022. In 2022, the above situation may result not only in a decline in the capacity to finance investments from the operating surplus on the nationwide scale in comparison to previous years, but also in the differentiation of these investment capacities within specific LGU types. Differentiation of this phenomenon in specific local governments may be affected by, inter alia, the adopted system of criteria of distribution of funds as part of the compensation for the decline in current income from PIT, especially in the development part of the general subsidy. Its application will result in a division of LGUs into local governments without compensation for the decline in inflows from PIT and local governments whose value of PIT losses has been overestimated.

References

- Czekaj M.: Panel: Zmiany w finansowaniu jednostek samorządu terytorialnego, XIII Międzynarodowe Forum Finansowo-Bankowe: Wyzwania współczesnych finansów – ryzyka, strategię, perspektywy, Warszawa 2021.
- Dafflon B.: Theory of Subnational Balanced Budget and Debt Control, [in:] B. Dafflon (ed.), Local Public Finance in Europe: Balancing the Budget and Controlling Debt. Edward Elgar, Chantengam, Northampton 2002.
- Devas N., Alam M., Deley S., Koranteng R.O., Venkatachalam P.: Financing Local Government, Commonwealth Secretariat, London 2008, p. 11.
- Dylewski M.: Nadwyżka operacyjna a decyzje finansowe jednostek samorządu terytorialnego, *Annales Universitatis Mariae Curie-Skłodowska Lublin. Sectio H*, 51, 6/2017, p. 75-84.
- Galiński P.: Możliwości finansowania inwestycji przez gminy w Polsce w latach 2010-2012, *Zeszyty Naukowe Uniwersytetu Szczecińskiego nr 802 Finanse, Rynki Finansowe, Ubezpieczenia*, 65/2014, p. 71-82.
- Gubernat E.: Zdolności inwestycyjne jednostek samorządu terytorialnego województwa dolnośląskiego w latach 2007-2013, *Finanse, Rynki Finansowe, Ubezpieczenia*, 6 (84)/2016, p. 71-83.
- Krzemińska A. : Znaczenie nadwyżki operacyjnej w budżecie gmin i miast na prawach powiatu na przykładzie województwa wielkopolskiego i lubelskiego, *Optimum. Economic Studies*, 2 (92)/2018, p. 61-67.
- Kubalski G.P., Czajkowski, J.M. : Skuteczność rekompensowania ubytku dochodów z udziału PIT przez część rozwojową subwencji ogólnej, *Analizy samorządowe*, 18/2022, p. 8-9.
- Nadwyżka operacyjna w jednostkach samorządu terytorialnego w latach 2008-2010, Ministerstwo Finansów, Warszawa 2010, p. 3.
- Nordhaus W. : Reflection on the Economics of Climate Change, *Journal of Economic Perspectives*, 7, 4/1993, p. 11-25.
- Ocena skutków regulacji z dnia 07.09.2021 r. do projektu ustawy o zmianie ustawy o podatku dochodowym od osób fizycznych, ustawy o podatku dochodowym od osób prawnych oraz niektórych innych ustaw. Nr w wykazie prac legislacyjnych Rady Ministrów: UD260, p. 562-563.
- Owsiak S.: *Finanse*, PWE, Warszawa 2015, p. 86.
- Polityka ekologiczna państwa 2030. Raport, Ministerstwo Środowiska, Warszawa 2018.

- Poniatowicz M., Salachna J.M., Perło, D.: Efektywne zarządzanie długiem w jednostce samorządu terytorialnego, Wolters Kluwer, Warszawa 2010.
- Prognoza ludności na lata 2014-2050, GUS, Warszawa 2014, p. 114 et seq.
- Samorzady odcięte od dochodów z PIT. Proponują rozwiązanie, Rzeczpospolita, 18.04.2022, <https://regiony.rp.pl/podatki/art36096791-samorzady-odciete-od-dochodow-z-pit-proponuja-rozwiazanie> (access: 18.04.2022).
- Sekuła A. Kształtowanie się dochodów majątkowych jednostek samorządu terytorialnego w latach 2007-2008, [in:] R. Broła (ed.), Gospodarka lokalna w teorii i praktyce, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, 109/2010, p. 252.
- Sołtyk P., Dębowska-Sołtyk M.: Finanse samorządowe, Difin, Warszawa 2006, p. 64.
- Swianiewicz P.: Finanse lokalne – teoria i praktyka, Municipium, Warszawa 2004.
- Szołno-Koguc J.: Subwencja ogólna jako instrument wsparcia transferowego samorządu gminnego, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, 485/2017, p. 463.
- Uchwała nr 8 Rady Ministrów z dnia 14 lutego 2017 r. w sprawie przyjęcia Strategii na rzecz Odpowiedzialnego Rozwoju do roku 2020 (z perspektywą do 2030 r.), Monitor Polski z 2017 r. poz. 260.
- Uchwała nr 84/2021 Rady Ministrów z dnia 1 lipca 2021 r. w sprawie ustanowienia Rządowego Funduszu Polski Ład: Programu Inwestycji Strategicznych - RM-06111-84-21.
- Ustawa z dnia 13 listopada 2003 r. o dochodach jednostek samorządu terytorialnego, Dz.U. z 2021 r. poz. 1672 as amend.
- Ustawa z dnia 14 października 2021 r. o zmianie ustawy o dochodach jednostek samorządu terytorialnego oraz niektórych innych ustaw, Dz.U. poz. 1927.
- Ustawa z dnia 27 sierpnia 2009 r. o finansach publicznych, Dz.U. z 2022 r. poz. 1634.
- Ustawa z dnia 27 sierpnia 2009 r. Przepisy wprowadzające ustawę o finansach publicznych, Dz.U. nr 157, poz. 1241.
- Ustawa z dnia 29 października 2021 r. o zmianie ustawy o podatku dochodowym od osób fizycznych, ustawy o podatku dochodowym od osób prawnych oraz niektórych innych ustaw, Dz.U. z 2021 r., poz. 2105.
- Ustawa z dnia 30 sierpnia 2019 r. o zmianie ustawy o podatku dochodowym od osób fizycznych oraz ustawy o zmianie ustawy o podatku dochodowym od osób fizycznych oraz niektórych innych ustaw, Dz.U., poz. 1387, as amend.
- Ustawa z dnia 31 marca 2020 r. o zmianie ustawy o szczególnych rozwiązaniach związanych z zapobieganiem, przeciwdziałaniem i zwalczaniem COVID-19, innych chorób zakaźnych oraz wywołanych nimi sytuacji kryzysowych oraz niektórych innych ustaw, Dz.U. poz. 568, as amend.).
- Ustawa z dnia 9 czerwca 2022 r. o zmianie ustawy o podatku dochodowym od osób fizycznych oraz niektórych innych ustaw, Dz.U. z 2022 r., poz. 1265.
- Wiewióra M.: Nadwyżka finansowa a samorząd, Serwis Samorządowy PAP, 2008, <https://samorzad.pap.pl/kategoria/archiwum/nadwyzka-finansowa-samorzad> (access: 15.05.2022).
- Zawora J., Zawora P.: Możliwości finansowania działalności inwestycyjnej przez gminy województwa podkarpackiego, Ekonomiczne Problemy Usług, 4, (129)/2017, p. 282.
- Zioło M.: Zewnętrzne, obce źródła finansowania wydatków inwestycyjnych gmin i determinanty ich doboru, Zeszyty Naukowe, Polskie Towarzystwo Ekonomiczne, 10/2011, p. 289-298.

Nadwyżka operacyjna JST w kontekście zmian prawnych wywołujących ubytki w dochodach bieżących JST z PIT

Streszczenie

Problematyka nadwyżki operacyjnej jednostek samorządu terytorialnego (JST) zyskuje coraz bardziej na znaczeniu m.in. z powodu uchwalenia zmian prawnych wywołujących ubytki w dochodach bieżących JST z PIT. Celem badań jest ocena kształtowania się nadwyżki operacyjnej JST w kontekście zmian prawnych (uchwalonych w latach 2019-2022) wywołujących te ubytki oraz ocena mechanizmów rekompensujących JST te ubytki. Do realizacji celu badawczego zastosowano: (1) analizę ilościową z uwzględnieniem danych Ministerstwa Finansów ze sprawozdań z wykonania budżetu JST za lata 2020-2021 oraz wieloletnich prognoz finansowych do planu budżetu JST na 2022 rok; (2) przegląd literatury przedmiotu oraz legislacji powiązanej z celem badań.

Z przeprowadzonej analizy dla lat 2020-2022 wynika, iż po okresie wzrostu wysokości nadwyżki operacyjnej we wszystkich typach JST w 2021 roku w stosunku do 2020 roku następuje istotny spadek jej wysokości w 2022 roku (według planu). Sytuacja ta dotyczy w skali Polski: gmin, miast na prawach powiatu oraz województw. W przypadku powiatów natomiast (w skali Polski) w 2022 roku w ogóle nie zaplanowano nadwyżki operacyjnej. Powyższa sytuacja może powodować nie tylko mniejsze możliwości finansowania inwestycji z nadwyżki operacyjnej w JST, ale także zróżnicowanie tych możliwości w obrębie poszczególnych typów JST. Na pogłębienie zróżnicowania tego zjawiska w poszczególnych samorządach może mieć wpływ m.in. przyjęty system kryteriów rozdziału środków finansowych w ramach rekompensaty ubytku w dochodach bieżących z PIT (w szczególności z części rozwojowej subwencji ogólnej).

Słowa kluczowe: finanse, nadwyżka operacyjna, JST, PIT, mechanizm rekompensujący

Kody JEL: G38, H72, H61, H41

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AGRICULTURAL LAND AS A PUBLIC GOOD

The aim of this article is to discuss the multifunctionality of agricultural land and its importance. A monographic method has been employed to elaborate on the research subject. A perusal of the relevant national and foreign literature has confirmed that agricultural land is a specific good with characteristics of both private and public goods. Agricultural land is a unique type of public good, a finding that supports the claim that a division of goods into strictly market and public ones is an excessive oversimplification. The so-called “mixed goods” (including substantive ones) which are shaped by the interplay of market forces, as well as the interests of groups and the state occupy an important position. The goods regarded to have positive external effects or a particular value to society are supported by the state or by economic entities (e.g., specific instruments of the Common Agricultural Policy). The unique importance of agricultural land as an asset with both public and market characteristics stems not only from its particular features, but also from the fact that it provides space for the achievement of public interest. Agricultural land plays many important roles that are essential not only to food producers, for whom it is the base of agricultural production, but also to the entire society.

Keywords: agricultural land, public good, multifunctionality of the land

JEL codes: A11, D74, Q15

Introduction

The theory of economics mostly deals with private goods, which can be divided, sold at a particular price, or consumed by the buyer in any amount – depending on the preferences and financial limitations. By purchasing private goods, buyers acquire the right of ownership, which they may decide not to share with anyone. This is a characteristic of most goods for which the price of exchange can be set in the market^{1,2}. What follows from this definition is that agricultural land in capitalist countries with free market economies has the features of a private good. However, as pointed out by Wilkin³, agricultural land has almost never – and in no political system – been treated as a purely market good, even though the scope of market regulation regarding this asset has changed. Agricultural land has a strong connection to various values (cultural, social, sentimental, political, etc.), which endow such land with a public role.

The theory of public goods constitutes an element of the theory of public choice, which operates within the scope of institutional economics. The pioneers of the public good concept include economists who raised the subject of the objective and scope of the

¹M. Jakubowski: Dobra publiczne i dobra wspólne, [in:] J. Wilkin (ed.), Teoria wyboru publicznego. Wstęp do ekonomicznej analizy polityki funkcjonowania sfery publicznej, Scholar, Warszawa 2005, p. 159.

²A. Kargol-Wasiluk: Zakres i struktura dóbr publicznych we współczesnej gospodarce na przykładzie państw UE-27, [in:] J. Wilkin (ed.), Jakość rządzenia w Polsce. Jak ja badać, monitorować i poprawiać, Scholar, Warszawa 2013, p. 120-133.

³J. Wilkin: Ziemia rolnicza jako dobro wielofunkcyjne, Konferencja z cyklu Debaty o rozwoju wsi – ewolucja struktury, ram instytucjonalnych i sposobów wykorzystania ziemi rolniczej w Polsce w latach 1989-2016, IRWiR-PAN, Warszawa 19.06.2017.

state's expenses and taxation (including D. Hume, J. Stuart Mill, A. Pigou, R. Musgrave, E. Lindahl, E. Sax and K. Wicksell). P. Samuelson⁴ is thought to be the author of the term public good. The first attempts to define or determine public goods were made in classic economics⁵. The ordinary understanding of public goods assumes that they are financed from public sources. Also, the types of such goods are well-defined. However, observations of the reality lead to the conclusion that the scope and structure of public goods change along with the maturity of the market economy and the state of civil society. Such differences follow from the promoted policies and the implemented vision of the state and also from common needs reported by the citizens⁶.

The public good is a type of good that has two basic, economic characteristics: 1) is non-competitive, i.e., when it enters the market, it can be consumed (used) by another person without incurring additional cost; 2) is non-excludable, i.e., potential consumers (users) of the public good cannot be excluded from its consumption (use)^{7, 8, 9}.

Economic theory distinguishes four basic types of goods: private, common, exclusive, and public. The criteria of this taxonomy are competitiveness, non-competitiveness (the consumption of a non-competitive good by one individual does not negatively affect the consumption by other individuals), exclusivity, and non-exclusivity. As rightly pointed out by Czyżewski¹⁰, when agricultural land is concerned, it is important to consider competitive goods (goods of competitive and non-exclusive characters are the so-called "common goods") because an increase in the consumption of the natural environment's utility can adversely affect its remaining utility on merit goods due to the multifunctionality of agriculture and its basic production factor (i.e., land).

Research methodology

The aim of this article is to demonstrate the multifunctional significance of agricultural land and to review this asset not only as a production factor, but – most of all – as a public good, particularly because this role has gained increasing importance in economic practice. The monographic method employed in this research allows us a) to focus on a specific object and ensure longer contact with the studied social reality, b) to make a detailed analysis of the studied phenomenon, c) to demonstrate both the current actual situation and the previous background through an analysis of various, converging documents, d) to implement an interdisciplinary approach to the research process¹¹. Both a descriptive and graphic presentation of facts and data has been used.

⁴ P.A. Samuelson: A Pure Theory of Public Expenditure, *The Review of Economics and Statistics*, 36/1954, p. 387-389.

⁵ A. Smith: *Badania nad naturą i przyczynami bogactwa narodów 2*, [translated by. A. Prejbisz, B. Jasińska], Wydawnictwo Naukowe PWN, Warszawa 2007, p. 16-18.

⁶ A. Kargol-Wasiluk: *Zakres i struktura...*, 2013, *op cit.*, p. 125.

⁷ D. Baldock, K. Hard, M. Scheele: *Dobra publiczne i interwencja publiczna w rolnictwie*, Europejska Sieć na Rzecz Rozwoju Obszarów Wiejskich, 2010, www.enrd.ec.europa.eu (access: 06.06.2022).

⁸ J.M. Buchanan: *The Demand and Supply of Public Goods*, Rand McNally, Chicago 1968, p. 7.

⁹ J.G. Head: *Public Goods and Public Policy*, *Public Finance*, 17/1962, p. 197-219.

¹⁰ A. Czyżewski: *Ziemia i jej renty w nowym paradygmacie rozwoju rolnictwa*. IX Kongresie Ekonomistów Polskich, PTE, Warszawa, 2013, p. 58-59.

¹¹ J. Sztumski: *Metoda monograficzna, jej zalety i niedostatki*, *Górnśląska Wyższa Szkoła Handlowa w Katowicach. Zeszyt Naukowy Katedry Socjologii i Psychologii*, 25/2004, p. 7-16.

Multifunctionality of agricultural land

Agricultural land has many functions which place it within public goods (or resources for the production of such goods), which may include food security, conservation of production resources (soil)^{12,13,14,15}, impact on the natural environment, or location of investment (Figure 1).

Private functions	Public functions
<ul style="list-style-type: none"> – object of ownership – production factor (food production) – source of income – location of work and residence – developing emotional ties to the location of work and residence – individual cultural and symbolic value 	<ul style="list-style-type: none"> – food security – energy security – conservation of production resources (soil) – impact on the natural environment – dissemination of tradition and culture (customs, rituals connected with land) – biodiversity – aestheticization of the terrain – agricultural landscape – foundation of national/regional culture, cultural identity – location of public investment



Public policies: agricultural, rural development, environment protection, landscape management, energy, etc.

Figure 1. Functions of agricultural land and regulatory policies

Source: based on J. Wilkin: *Ziemia rolnicza...* 2013, *op.cit.*

What unites private and public functions is the adherence to the principles of sustainable development. The surety of food security, cultivation of folk traditions, preservation of cultural heritage, and management of the rural landscape are some of the elements contributed by the agricultural sector to the sphere of social continuity, together with the basic production factor (i.e., land)¹⁶.

In the classification of economic goods drawn up by economists, agricultural land does not have a clear attribution. It is hard to consider it a purely private or public good. In free market economies (including Poland's), agricultural land is mostly a private good subject to market transactions. Trading in agricultural land is limited due to state interventionism. This is why we do not regard it as "a purely market good". Many non-market and non-commercial goods, which are vital to society, are generated on private agricultural land. This asset is strongly linked to the country's national culture, its natural and architectural landscape, the operation and development of rural areas, and the generation of

¹²M. Podstawka: *Grunty marginalne w Polsce*, Bibliotheca Fragmenta Agronomica, Olsztyn 1998, p. 310.

¹³R. Marks-Bielska, S. Bielski: *Wzrost roli rolnictwa w zapewnieniu bezpieczeństwa energetycznego kraju*, *Więś i Rolnictwo*, 4/2013, p. 150.

¹⁴D., Milczarek-Andrzejewska, J. Wilkin, R. Marks-Bielska, A. Czarnecki, A. Bartczak: *Konflikty o ziemię rolną – perspektywa ekonomiczna*, *Gospodarka Narodowa*, 3 (304)/2020, p. 5.

¹⁵S. Bielski, R. Marks-Bielska, A. Zielińska-Chmielewska, K. Romanekas, E. Šarauski: *Importance of Agriculture in Creating Energy Security – A Case Study of Poland*, *Energies*, 14/2021, p. 2465.

¹⁶E. Majewski: *Trwały rozwój i trwałe rolnictwo – teoria a praktyka gospodarstw rolniczych*, Wydawnictwo SGGW, Warszawa 2008, p. 6.

industrial materials – including energy resources¹⁷. Agricultural land is an important element of an economic and ecological system. In the economic classification of goods, it can therefore be regarded as “a mixed good” (the so-called “merit good”).

Czyżewski¹⁸ demonstrated that the welfare of the natural environment and rural areas can be regarded as a common good (i.e., a good not attributed to specific entities, so it is not transferable). Thus, natural resources are utilized on a “first come, first served” basis, and the cost and benefits of such use are hard to evaluate and attribute to specific users objectively. An attempt at their evaluation incurs high transaction costs. However, an omission of such evaluation generates transaction costs *ex-post* (incurred in removing adverse effects of unsuitable use of resources or the budget redistribution of rent, which agriculture “lost” for the sake of other sectors).

Aside from water, natural resources, fauna and flora or landscape, land belongs to the elements of the natural environment. Land, as a natural resource, has an important role, constituting a system of supporting life, a set of natural values, a base of natural resources, and an environment playing an important part in assimilation processes. These functions make the foundation of the biological existence and the economic activity of humanity, and their continuation should be a superior imperative for every man¹⁹. This aligns with the definition construed by Costanza²⁰, regarded as “a milestone in the development of ecological economics”. In his view, sustainability is a correlation between man-managed economic systems and larger, dynamic – but slowly changing – ecological systems in which the existence of humanity may last forever, human individuals may prosper, and human cultures may thrive. This must be achieved while maintaining the effects of human activity in such limitations so as not to destroy the diversity, complexity and ecological functions of life-supporting systems.

The emergence of an ecological barrier has an impact on the agricultural economy through changing price relations following the theorem of the scarcity of goods. The most important factor is the limited area of land which can be used for farming. Around 1.5 billion ha (around 35% of the Earth’s land surface) is dedicated to agricultural production (farmlands, meadows, and pastures). This area is ever-decreasing due to wind and water erosion, as well as the salinity of irrigated soil. Statistics show the loss of soil to the extent threatening the sustainable fertility in one-third of agricultural land and deterioration of approximately half of pasture areas into semi-desert and desert areas because of the overly intensive use (grazing)²¹.

European farming occupies approximately 40% of the land surface, which has an enormous effect on the state of the environment in rural areas and the possibilities of its use. Entirely natural areas do not occupy much space in Europe, so the quality of the environment depends to a large extent on the manner of agricultural land management. A well-managed soil has a good structure, optimal organic content, and resists water and wind erosion. Most agricultural practices impact the functionality of soil. Soil can be protected through the use of suitable manners of farming²². Farming typical of a peasant

¹⁷J. Wilkin: Ziemia rolnicza – dobro wielofunkcyjne, *Więś i Rolnictwo*, 1 (162)/2014, p. 114.

¹⁸A. Czyżewski: Ziemia i jej renty..., 2013, *op.cit.*, p. 59.

¹⁹E. Majewski: Trwały rozwój ..., 2008, *op.cit.*, p. 13.

²⁰Costanza (ed.): *Ecological Economics: The Science and Management of Sustainability*, Columbia University Press, New York 1991, p. 17.

²¹J. St. Zegar: Przesłanki nowej ekonomii agrarnej we współczesnym świecie, [in:] A. Grzelak, A. Sapa (eds), *Agroekonomia w warunkach rynkowych. Problemy i wyzwania, Zeszyty Naukowe*, Wyd. Uniwersytetu Ekonomicznego w Poznaniu, 150/2010, p. 11-28.

²²D. Baldock, K. Hard, M. Scheele: *Dobra publiczne...*, 2010, *op. cit.*, p. 4.

society used to preserve the natural fertility and often led to an increase in nutritional content levels. Rational farming contributed to pro-ecological activities, which allowed maintaining an important, limited land supply in good condition for future generations, in line with what we now recognize as principles of sustainable development. In conjunction with the intensification of agriculture, soil quality²³ very often deteriorated, and its legal protection became necessary.

Farming activities may cause positive external effects²⁴ (outsider benefits, like fertilization of soil) or negative outsider effects²⁵ (outside costs, e.g., soil erosion through wrong agricultural practices). In both of these effects, there is a need for internalization of external effects, which involves allowing the benefits or outside costs – following from the operation of a unit – into the economic account. To address this need, ecological and agricultural policy instruments are used in the form of direct legal regulation (environmental standards binding in the cross-compliance principle in The CAP), as well as economic regulation (economic instruments stimulating the benefits and limiting the outside costs to the environment)^{26, 27}.

Farmers make direct use of natural resources in production processes. Inadequate production practices in farming may adversely impact soil, surface and underground waters, and air. Inappropriate use of industrial means of production (like chemical fertilizers and pesticides) may negatively affect many ecosystems, leading to the loss of natural fauna and flora, and disturbance in the water economy or microclimate. On the other hand, farmers operating within the market economy are obliged to act in accordance with social needs and, at the same time, to maximize their goals through production and economic effects in a competitive environment. The realization of productive and economic objectives in

²³In Poland, soils are characterized by low quality. This is mostly due to the type of parent rock, where 70% are light clay and heap sands, extensively sorted by glacial waters. This textural composition and its diversity in the soil profile entail the low capacity of the soil to retain and store water, and this in turn results in low yields and high variability. Apart from the natural qualities of soil, another factor which defines the agricultural usefulness of soil is its fertility, shaped by farming practices, where rational agricultural technologies influence the soil's reaction, content of macro- and micronutrients, and content of organic matter (More on this question: J. Kuś, M. Matyka: Zróżnicowanie warunków przyrodniczych i organizacyjnych produkcji rolniczej w Polsce. Z badań nad rolnictwem społecznie zrównoważonym, [in:] J. St. Zegar (ed.), Wybrane zagadnienia zrównoważonego rozwoju rolnictwa, IRWiR-PIB, Warszawa 2013, p. 47-70).

²⁴ External effects (*externalities*) – outcomes of economic activity which do not have an adequate reflection in the calculation of costs and effects of economic activity, and which concern the so-called “third persons”, not parties to the contract. They are examples of market failures.

²⁵ The specific character of agriculture arises from the fact that agricultural production generates both positive and negative consequences to the natural environment. For example, as regards soils, farming contributes to soil degradation and erosion; on the other hand, it preserves soil fertility and prevents erosion. It is worth underlining that the environment is not affected negatively by agriculture per se, but by certain agricultural technologies (J. St. Zegar: Przesłanki nowej ekonomii agrarnej we współczesnym świecie, [in:] A. Grzelak, A. Sapa (eds), Agroekonomia w warunkach rynkowych. Problemy i wyzwania. Zeszyty Naukowe. Uniwersytetu Ekonomicznego w Poznaniu, 150/2010, p. 15-16).

²⁶A. Harasim: Ocena rolnictwa i obszarów wiejskich jako źródła dóbr publicznych w ujęciu regionalnym. Wybrane problemy produkcji rolniczej z uwzględnieniem aspektu dóbr publicznych, *Studia i Raporty IUNG-PIB*, 43 (17)/2015, p. 129-130.

²⁷A. Harasim: Zagadnienie dóbr publicznych związanych z rolnictwem i obszarami wiejskimi. Wybrane problemy produkcji rolniczej z uwzględnieniem aspektu dóbr publicznych, *Studia i Raporty IUNG-PIB*, 43 (17)/2015, p. 139.

farming does not always go along with the interest of the environment and general society^{28, 29}.

The principles of the rational management of agricultural land as the basic production asset were laid out by Tomczak³⁰ as follows:

- preservation of farmland in particular, that of higher quality, to the largest possible extent for the production of food and as a resource for future generations
- protection of farmland against the deterioration of its productive capacity through agrotechnology, regulation of water relations, anti-erosion measures, etc.
- treatment of agricultural land as an important element of domestic natural resources and domestic production potential.

Soil belongs to the basic elements of agricultural production, playing many important roles such as the production of biomass, stabilization of chemise and filtration of contaminations (sorption), conversion of chemical content and water storage, provision of conditions for biodiversity, accumulation of organic carbon, protection of geological and archeological heritage, and physical and cultural environment for human activity. For agriculture, the productive value of the soil is essential as it provides plants with rooting space and allows them to store nutrients and water. Many ways of the economical use of Earth's surface may lead to the loss of organic matter or properties which allow life and growth of desired crops. One of the most common environmental threats to the development of agriculture in Poland is the degradation of organic matter³¹. Farmers should apply such agrotechnological measures that will reduce and, even more importantly, prevent such negative consequences of an unsustainable balance of organic matter in the soil. Negative effects impacting soil include erosion, soil mass movements, loss of organic carbon, contamination with toxic substances (e.g., heavy metals or salt), closing of soil pores, and soil compaction.

These hazards result from agricultural and non-agricultural activities. In extreme cases, the intensification of degrading processes may lead to the total loss of a soil's functions as a habitat, production means or water retention site, which means its exclusion from agricultural use³².

Because farmers use a substantial part of the agricultural production environment, they have a major impact on shaping it. It is, therefore, desired that the external effects of the agricultural use of land be positive. The progressing degradation of soil caused by

²⁸ E. Gajos, K. Prandecki: Rolnictwo a afekty zewnętrzne, [in:] K. Prandecki, E. Gajos (eds), *Z badań nad rolnictwem społecznie zrównoważonym* (40). Rynkowe i instytucjonalne metody internalizacji efektów zewnętrznych. Monografie Programu Wieloletniego (2), IERiGŻ-PIB, Warszawa 2017, p. 17-35.

²⁹ J. Góral, W. Rembisz: Produkcja w rolnictwie w kontekście ochrony środowiska, *Roczniki Naukowe Ekonomii Rolnictwa i Rozwoju Obszarów Wiejskich*, 104, 1/2017, p. 7-21.

³⁰ F. Tomczak: *Gospodarka rodzinna w rolnictwie. Uwarunkowania i mechanizmy rozwoju*, IRWiR-PAN, Warszawa 2006, p. 202.

³¹ All organic compounds aside from undecomposed parts of plants, animal remains and live microorganisms, which are in soil. The presence of these substances in soil is crucial for the proper growth of plants. Maintaining a good balance of organic matter in soil is considered to be a significant indicator of proper management in agriculture, which takes into account environmental requirements. In order to maintain the balance of organic substance in soil, the two most common measures are organic fertilization and an adequate crop rotation system with break crops. Maintaining a positive balance of organic substances is one of the basic principles of the sustainable development of agriculture (K. Prandecki: *Zagrożenia środowiska pochodzenia rolniczego jako skutek efektów zewnętrznych* [in:] K. Prandecki (ed.), *Z badań nad rolnictwem społecznie zrównoważonym* (32). *Efekty zewnętrzne i dobra wspólne w rolnictwie – identyfikacja problemu*, IERiGŻ-PIB, Warszawa 2015, p. 73).

³² S. Krasowicz, W. Oleszek, J. Horabik, R. Dębicki, J. Jankowiak, T. Stuczyński, J. Jadczyński: *Racjonalne gospodarowanie środowiskiem glebowym Polski*, *Polish Journal of Agronomy*, 7/2011, p. 44.

intensive farming forces us to search for and develop new agricultural techniques to facilitate soil protection and biodiversity. According to Smagacz³³, modern land cultivation, apart from promoting the volume and stability of yields, should also create conditions to maintain soil fertility and limit the adverse impact of agriculture on the natural environment.

The soil environment provides opportunities for agricultural production and satisfaction of nutritional needs, forage, raw materials for industry, and energy resources. The principles of common agricultural policy and international conventions oblige their parties to limit the hazards to the natural environment and its elements (including the soil). Rational management of the soil environment in Poland is a strategic objective and necessity³⁴.

“Soil functionality” belongs to environmental public goods generated by agriculture. Maintenance of well-functioning soil and improvement of the quality of water are considered priority goals. Regarding the functionality of soil, approximately 50% of areas in the Rural Development Program are thought to need measures to reduce soil erosion³⁵.

In the European Union, a substantial part of the public support for agriculture allocated under the Common Agricultural Policy is increasingly often treated as remuneration for the production of public goods and services or mixed goods, considered important to society but inadequately priced or not rewarded by the market. Non-commercial goods resulting from the use of land and farming have become the basis of so-called “social legitimacy” of the public support of agriculture³⁶. Shortcomings of the market allocation and the lack of automatic remuneration for the provision of socially desired goods create the perspective for solutions within the agricultural policy³⁷. As demonstrated by Daniłowska³⁸, farmers may intentionally target the production of specific public goods as the basic product or an external effect, which may entail a shift in the technology of cultivation or a change in the manner of land use, or even abandonment of farming.

On the basis of his research³⁹, Czyżewski indicated adverse effects of public goods in rural areas, including a larger gap in farming land value (as the difference between the discounted value of income and the market value and price). Much volatility in agricultural land prices was attributed to non-production factors (broadly understood environmental utility and location). However, it is not the outlays on public goods from the Common Agricultural Policy that capitalized on the price of land; the price was driven by specific non-agricultural utilities (*amenities*).

³³J. Smagacz: Uprawa roli jako element zrównoważenia środowiskowego produkcji roślinnej. Wybrane problemy produkcji rolniczej z uwzględnieniem aspektu dóbr publicznych, *Studia i Raporty IUNG-PIB*, 4 (17)/2015, p. 89-101.

³⁴S. Krasowicz, W. Oleszek, J. Horabik, R. Dębicki, J. Jankowiak, T. Stuczyński, J. Jadczyński: *Racjonalne...*, 2011, *op. cit.*, p. 43.

³⁵D. Baldock, K. Hard, M. Scheele: *Dobra publiczne...*, 2010, *op. cit.*, p. 6.

³⁶J. Wilkin: *Ziemia rolnicza...*, 2014, *op. cit.*, p. 115.

³⁷A. Czyżewski, P. Kułyk: *Dobra publiczne w koncepcji wielofunkcyjnego rozwoju rolnictwa: ujęcie teoretyczne i praktyczne*, *Problemy Rolnictwa Światowego*, 11 (26)/2011, 2, p. 23.

³⁸A. Daniłowska: *Koncepcja dóbr publicznych a rolnictwo*. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, Agrobiznes 2014 Problemy ekonomiczne i społeczne*, 360/2014, p. 250.

³⁹B. Czyżewski: *Kierat rynkowy w europejskim rolnictwie*, Wydawnictwo PWN, Warszawa 2017, p. 168.

Conclusions

Agricultural land is a particular good, which combines the elements of both private (e.g., object of ownership, production factor (food production), source of income, location of work and residence, developing emotional ties to the location of work and residence, individual cultural and symbolic value) and public goods (e.g., food security, energy security, conservation of production resources (soil), impact on the natural environment dissemination of tradition and culture, biodiversity, the aestheticization of the terrain, agricultural landscape, the foundation of national/regional culture, cultural identity, location of public investment). It has many important functions, essential not only to food producers, as the basic production factor in agriculture, but also to general society. Agricultural land is a specific example of public good, which makes it evident that the division of goods into private and public ones is an oversimplification. The so-called "mixed goods" (including substantive ones desired by society and produced in the common interest of its members)⁴⁰, which result from an interplay of market forces, group interests and state interests, are equally important; they are attributed to produce positive external effects (e.g., maintaining soil in good agricultural condition, biodiversity) or a particular value to society and, as such, they are supported by the state or economic entities (e.g., through specific instruments of the Common Agricultural Policy). The unique importance of agricultural land as a resource with both market and public characteristics follows not only from its specific features, but also from the fact that it creates the space for achieving public objectives.

References

- Baldock D., Hard K., Scheele M.: Dobra publiczne i interwencja publiczna w rolnictwie, Europejska Sieć na Rzecz Rozwoju Obszarów Wiejskich, 2010, www.enrd.ec.europa.eu (access: 06.06.2022).
- Bielski S., Marks-Bielska R., Zielińska-Chmielewska A., Romaneckas K., Šaraukis E.: Importance of Agriculture in Creating Energy Security - A Case Study of Poland. *Energies*, 14 (9)/2021, p. 2465.
- Buchanan J.M.: *The Demand and Supply of Public Goods*, Rand McNally, Chicago, 1968.
- Costanza R. (ed.): *Ecological Economics: The Science and Management of Sustainability*, Columbia University Press, New York 1991.
- Czyżewski A., Kułyk P.: Dobra publiczne w koncepcji wielofunkcyjnego rozwoju rolnictwa: ujęcie teoretyczne i praktyczne, *Problemy Rolnictwa Światowego*, 11 (26)/2011, 2, p. 16-25.
- Czyżewski A.: Ziemia i jej renty w nowym paradygmacie rozwoju rolnictwa. IX Kongresie Ekonomistów Polskich, PTE, Warszawa, 2013, p. 58-59.
- Czyżewski B.: *Kierat rynkowy w europejskim rolnictwie*, Wydawnictwo PWN, Warszawa 2017.
- Daniłowska A.: Koncepcja dóbr publicznych a rolnictwo. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, Agrobiznes 2014 Problemy ekonomiczne i społeczne*, 360/2014, p. 244-252.
- Gajos E., Prandecki K.: Rolnictwo a afekty zewnętrzne. W: *Z badań nad rolnictwem społecznie zrównoważonym (40). Rynkowe i instytucjonalne metody internalizacji efektów zewnętrznych. Monografie Programu Wieloletniego (2)*, IERiGŻ-PIB, Warszawa 2017.

⁴⁰Szerzej: J. Wilkin: Dobra dostarczane przez rolnictwo w świetle teorii dóbr, [in: J. Wilkin (ed.), *Wielofunkcyjność rolnictwa. Kierunki badań, podstawy metodologiczne i implikacje praktyczne*, IRWiR-PAN, Warszawa 2010, p. 41-51.

- Góral J., Rembisz W.: Produkcja w rolnictwie w kontekście ochrony środowiska, *Roczniki Naukowe Ekonomii Rolnictwa i Rozwoju Obszarów Wiejskich*, 104, 1/2017, p. 7-21.
- Harasim A.: Ocena rolnictwa i obszarów wiejskich jako źródła dóbr publicznych w ujęciu regionalnym. Wybrane problemy produkcji rolniczej z uwzględnieniem aspektu dóbr publicznych, *Studia i Raporty IUNG-PIB*, 43 (17)/2015. p. 129-130.
- Harasim A.: Zagadnienie dóbr publicznych związanych z rolnictwem i obszarami wiejskimi. Wybrane problemy produkcji rolniczej z uwzględnieniem aspektu dóbr publicznych, *Studia i Raporty IUNG-PIB*, 43 (17)/2015, p. 117-139.
- Head J.G.: Public Goods and Public Policy, *Public Finance*, 17/1962, p. 197-219.
- Jakubowski M.: Dobra publiczne i dobra wspólne, [in:] J. Wilkin (ed.), *Teoria wyboru publicznego. Wstęp do ekonomicznej analizy polityki funkcjonowania sfery publicznej*, Scholar, Warszawa 2005, p. 159-183.
- Kargol-Wasiluk A.: Zakres i struktura dóbr publicznych we współczesnej gospodarce na przykładzie państw UE-27, [in:] J. Wilkin (ed.), *Jakość rządzenia w Polsce. Jak ją badać, monitorować i poprawiać*, Scholar, Warszawa 2013, p. 120-133.
- Krasowicz S., Oleszek W., Horabik J., Dębicki R., Jankowiak J., Stuczyński T., Jadczyński J.: Racjonalne gospodarowanie środowiskiem glebowym Polski, *Polish Journal of Agronomy*, 7/2011, p. 43-59.
- Kuś J., Matyka M.: Zróżnicowanie warunków przyrodniczych i organizacyjnych produkcji rolniczej w Polsce. Z badań nad rolnictwem społecznie zrównoważonym, [in:] J. St. Zegar (ed.), *Wybrane zagadnienia zrównoważonego rozwoju rolnictwa*, IRWiR-PIB, Warszawa 2013, p. 47-70
- Majewski E.: Trwały rozwój i trwałe rolnictwo – teoria a praktyka gospodarstw rolniczych, *Wydawnictwo SGGW*, Warszawa 2008.
- Marks-Bielska R., Bielski S.: Wzrost roli rolnictwa w zapewnieniu bezpieczeństwa energetycznego kraju, *Więś i Rolnictwo*, 4/2013, p. 149-160.
- Milczarek-Andrzejewska D., Wilkin J., Marks-Bielska R., Czarnecki A., Bartczak A.: Konflikty o ziemię rolną – perspektywa ekonomiczna, *Gospodarka Narodowa*, 3 (304)/2020, p. 5-31.
- Podstawka M.: Grunty marginalne w Polsce, *Bibliotheca Fragmenta Agronomica*, Olsztyn 1998.
- Prandecki K.: Zagrożenia środowiska pochodzenia rolniczego jako skutek efektów zewnętrznych [in:] K. Prandecki (ed.), *Z badań nad rolnictwem społecznie zrównoważonym (32). Efekty zewnętrzne i dobra wspólne w rolnictwie – identyfikacja problemu*, IERiGŻ-PIB, Warszawa 2015, p. 68-89.
- Samuelson P.A.: A Pure Theory of Public Expenditure, *The Review of Economics and Statistics*, 36/1954, p. 387-389.
- Smagacz J.: Uprawa roli jako element zrównoważenia środowiskowego produkcji roślinnej. Wybrane problemy produkcji rolniczej z uwzględnieniem aspektu dóbr publicznych, *Studia i Raporty IUNG-PIB*, 4 (17)/2015, p. 89-101.
- Smith A.: *Badania nad naturą i przyczynami bogactwa narodów 2*, [translated by. A. Prejbisz, B. Jasińska], *Wydawnictwo Naukowe PWN*, Warszawa 2007.
- Sztumski J.: Metoda monograficzna, jej zalety i niedostatki, *Górnośląska Wyższa Szkoła Handlowa w Katowicach. Zeszyt Naukowy Katedry Socjologii i Psychologii*, 25/2004, p. 7-16.
- Tomczak F.: *Gospodarka rodzinna w rolnictwie. Uwarunkowania i mechanizmy rozwoju*, IRWiR-PAN, Warszawa 2006.
- Wilkin J.: Dobra dostarczane przez rolnictwo w świetle teorii dóbr, [in:] J. Wilkin (ed.), *Wielofunkcyjność rolnictwa. Kierunki badań, podstawy metodologiczne i implikacje praktyczne*, IRWiR-PAN, Warszawa 2010.
- Wilkin J.: Ziemia rolnicza – dobro wielofunkcyjne, *Więś i Rolnictwo*, 1 (162)/2014, p. 113-121.
- Wilkin J.: Ziemia rolnicza jako dobro wielofunkcyjne, *Konferencja z cyklu Debaty o rozwoju wsi – ewolucja struktury, ram instytucjonalnych i sposobów wykorzystania ziemi rolniczej w Polsce w latach 1989-2016*, IRWiR-PAN, Warszawa 19.06.2017 r.

Zegar J. St. Przesłanki nowej ekonomii agrarnej we współczesnym świecie, [in:] A. Grzelak, A. Sapa (eds), *Agroekonomia w warunkach rynkowych. Problemy i wyzwania*, Zeszyty Naukowe, Wyd. Uniwersytetu Ekonomicznego w Poznaniu, 150/2010, p. 11-28.

Ziemia rolnicza jako dobro publiczne

Streszczenie

Celem niniejszego artykułu jest wskazanie wielofunkcyjności znaczenia ziemi rolniczej. Do opracowania podjętego problemu badawczego wykorzystano metodę monograficzną. Na podstawie krajowej i zagranicznej literatury przedmiotu potwierdzono, że ziemia rolnicza jest szczególnym dobrem, posiadającym cechy zarówno dóbr prywatnych, jak i publicznych. Ziemia rolnicza jest szczególnym przykładem dobra publicznego. Na przykładzie ziemi, potwierdzono pogląd, że klasyfikacja dóbr na czyste rynkowe i publiczne jest nadmiernym uproszczeniem. Ważne miejsce zajmują tzw. dobra mieszane (w tym merytoryczne), które są efektem oddziaływania sił rynkowych, interesów grupowych i państwa. Te dobra, którym przypisuje się pozytywne efekty zewnętrzne lub szczególną wartość dla społeczeństwa są przez państwo, lub ugrupowania gospodarcze wspierane (np. przez określone instrumenty wspólnej polityki rolnej). Szczególne znaczenie ziemi rolniczej jako zasobu o cechach zarówno dóbr rynkowych, jak i publicznych wynika nie tylko z jej specyficznych cech, lecz także wiąże się z faktem, że jest ona miejscem realizacji celu publicznego. Ziemia rolnicza pełni wiele ważnych funkcji, istotnych nie tylko dla producentów rolnych, stanowiąc podstawowy czynnik produkcji w rolnictwie, lecz także dla całego społeczeństwa.

Słowa kluczowe: ziemia rolnicza, dobro publiczne, wielofunkcyjność ziemi

Kody JEL: A11, D27, Q15

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FRAUD RISK IN TIMES OF CRISIS AND THE DEVELOPMENT OF ITS MITIGATION TOOLS

The phenomenon of fraud has accompanied organizations since their beginnings. Its scale and frequency of occurrence are changing with the economic, legal and economic situation in the domestic and international markets. The factors conducive to its escalation are crisis situations, the determinants of which are to be found in both external and internal factors. Hence, in order to reduce the probability of occurrence and the effects of the impact of fraud risk on the organization, it is necessary to take appropriate measures and implement control mechanisms. The purpose of the publication is to analyze the development of anti-fraud controls diagnosed on the basis of periodic studies of the phenomenon of fraud and conducted by the ACFE organization between 2006-2022 and to assess the degree of their application in Polish business entities. The basic research method was quantitative and qualitative analysis. The analyses carried out showed that entities use anti-fraud controls. However, the prevalence of their application is progressing in accordance with the implementation of legal regulations and guidelines in this area. This means that state and international organizations' activities significantly impact the development of anti-fraud controls.

Keywords: fraud risk, fraud risk management, crisis

JEL Codes: D81, D82, D84, D85

Introduction

Fraud is a common phenomenon experienced by almost every organization. It represents certain market deviations that marginalize the theory of rational action¹. In turn, one of the assumptions of the theory of economics is the assertion of the infallibility of the market and its participants, which is supposed to ensure the rationality of decisions². Modern economics usually presents the free market as a well-functioning mechanism; however, this theory often deviates from reality³. This is because the market is unable to deal with the problems caused by fraud as susceptibility to fraud is a feature usually overlooked in economic theory⁴. In turn, the problem of rationality has long been described in the literature on the subject; among others, J.S. Mill, J.M. Keynes and J.K. Galbraith pointed out the discrepancy between economic theory and socio-economic reality⁵. They criticized the assumption of rational action, pointing out that economic theories should consider the lack

¹ E. Mączyńska: Kryzysy jako impulsy zmian systemów społeczno-gospodarczych, *Mazowsze Studia Regionalne, Mazowieckie Biuro Planowania Regionalnego w Warszawie*, 37, 2/2021, p. 11-32.

² A.G. Akerlof, R.J. Shiller, R. Shiller: *Animal Spirits: How Human Psychology Drives the Economy, and Why It Matters for Global Capitalism*, Princeton University, Princeton 2009, p. 198-200.

³ G. Rist: *The History of development. From western origin to global faith*, Zed Books, London, New York 2014.

⁴ E. Mączyńska: *Niezbywalne funkcje państwa – refleksje wokół książki G.A. Akerlofa i R.J. Shillera pt. Złowić frajera. Ekonomia manipulacji i oszustwa*, PTE, Warszawa 2017, p. 49-50.

⁵ S.P. Dunn, S. Pressman: *The Economic Contributions of John Kenneth Galbraith*, *Review of Political Economy*, 17, 2/2005, p. 161-209; Dzionek-Kozłowska J., *Model homo economicus. Geneza, ewolucja wpływ na rzeczywistość gospodarczą*, Wydawnictwo Uniwersytetu Łódzkiego, Łódź 2018, p. 21-22.

of human rationality in decision-making⁶. It is worth noting that the economic theories of time increasingly take the paradigm of man being guided by non-economic rationale into account⁷.

The absolute assumption of rational action is impossible under the conditions of the development of the phenomenon of fraud, which is now one of the key threats to the modern economy⁸. The scale of this phenomenon intensifies depending on the economic situation. The frequency and scope of its occurrence also vary. Hence, its development is significantly influenced by crisis situations, which cannot be excluded from economic life⁹. Although, as Otmar Issing noted, according to Jean Monnet, a crisis is always needed to make progress¹⁰. However, given the scale of the growth of fraud, its effects may be much less beneficial to the economy. This is confirmed by a survey conducted by the Association of Certified Fraud Examiners (ACFE)¹¹, which indicates that as many as more than half of respondents observed an increase in fraud 12 months after the financial crisis began in 2008¹². In turn, the results of a survey of market players at the time showed that the uncertainty of the economic situation, and thus the risks of fraud risk, are becoming increasingly noticeable¹³. This is influenced not only by the pandemic situation related to COVID-19, but also by the armed conflict in Ukraine and the accompanying energy crisis the effects of which could be long-term. Fear of a recession may result in reduced investment and liquidity problems for business entities, and the consequence of this may be a growing risk of fraud – especially financial fraud – which may take various forms: embezzlement of assets, fraudulent financial reporting, or corruption¹⁴.

The reasons for the growing risk of fraud in times of crisis should be seen in relation to both external and internal factors. Among the external determinants of economic crises, exogenous and endogenous factors should be mentioned. The former are a consequence of such phenomena as epidemics, wars, fraud, and speculation. The latter are related to the industrialization of the economy which, as industry develops, transforms from local to economy-wide and international¹⁵.

Internal determinants of economic crises refer to the situation and structure within market entities. First and foremost, among them is the growing pressure associated with the company's deteriorating performance or the likelihood of its bankruptcy. Employees

⁶ K. Wach: Od człowieka racjonalnego do emocjonalnego. Zmiana paradygmatu nauk ekonomicznych, *Horyzonty Wychowania*, 9 (17)/2010, p. 96.

⁷ Dopfer K.: The Economic Agent as Rule Maker and Rule User: Homo Sapiens, Economicus, *Journal of Evolutionary Economics*, 14/2004, p. 179.

⁸ G.A. Akerlof, R.J. Shiller: *Złowić frajera. Ekonomia manipulacji i oszustwa* wyd. 2, Polskie Towarzystwo Ekonomiczne, Warszawa 2021, p. 198-200.

⁹ M. Bochenek M.: Rozważania historyczno-semantyczne na temat kryzysów ekonomicznych, *Acta Universitatis Nicolai Copernici, Ekonomia*, 63, 2/2012, p. 147-159; M. Bochenek: Lekcja z historii kryzysów gospodarczych na świecie, *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 39, 1/2009, p. 54-62.

¹⁰ O. Issing: The COVID-19 crisis: A Hamilton moment for the European Union? *International Finance* 2020, p. 340-347, <https://doi.org/10.1111/inf.12377>

¹¹ The Association of Certified Fraud Examiners (ACFE) has been publishing Reports to the Nation on Occupational Fraud and Abuse since 1996. It is the largest known privately funded study on the subject.

¹² Occupational Fraud: A Study of the Impact of an Economic Recession, ACFE, Austin TX 2019.

¹³ D. Słomski: Takiej kumulacji zagrożeń dla biznesu nie było od lat 80. Oto sześć głównych powodów, *Business Insider*, 2022, <https://businessinsider.com.pl/biznes/glowne-problemy-przedsiębiorców-takiej-kumulacji-nie-było-od-lat-80/xm98tn8> (access: 28.08.2022).

¹⁴ M. Kutera: *Nadużycia finansowe. Wykrywanie i zapobieganie*, Difin, Warszawa 2016, p. 5-27.

¹⁵ N. Omar, Z.A. Johari, S. Hasnan: Corporate Culture and the Occurrence of Financial Statement Fraud: A Review of Literature, *Procedia Economics and Finance*, 31/2015, p. 367-372.

particularly feel this pressure¹⁶. As a result, there is a need to take urgent, immediate solutions which are often accompanied by irrationality of action entailing dishonest and unethical behavior, a desire to take advantage of emerging loopholes in procedures, laws, or other opportunities that mitigate the effects of crisis situations¹⁷. As a consequence, a phenomenon of information asymmetry occurs when the parties have different information about the company, which can result in fraudulent situations¹⁸.

It is worth noting that information asymmetry plays a special role in explaining the phenomenon of fraud and abuse. It indicates that economic agents operate in an environment of constant uncertainty caused by inadequate information. Thus, when making decisions, market participants are guided by previous choices, basing future economic figures on information that is no longer valid. In many situations, information asymmetry is a roadblock to a mutually beneficial contract. This consequently leads either to moral hazard fraud or to the abandonment of the deal by the one party who feels uninformed (adverse selection). The phenomenon of information asymmetry is a subject of academic¹⁹ and research interest²⁰. It refers to the creation of such problems as the aforementioned adverse selection, the problem of agency or moral hazard, which have important implications for the rationale for committing fraudulent acts.

Taking into account the above considerations, the current economic situation and the experience of previous financial crises, entities cannot afford to be indifferent to the risks of fraud²¹. Unfortunately, the growing number of corporate scandals over the past century indicates that despite the efforts made and regulations introduced, the frequency of reported fraud cases remains high²². Currently, fraud has become one of the primary contributors to an organization's losses. Studies show that they reach up to several percent of companies' annual revenues²³. This shows that fraud is a serious and constantly evolving

¹⁶ M. Marmot, E. Bloomer, P. Goldblatt: The Role of Social Determinants in Tackling Health Objectives in a Context of Economic Crisis, *Public Health Reviews*, 9/2013, p. 1-2.

¹⁷ Tarcza antyfraudowa – jak zapobiegać nadużyciom w czasie kryzysu?, Tarcza antyfraudowa - jak zapobiegać nadużyciom w czasie kryzysu?, PwC, 2020, <https://www.pwc.pl/pl/artykuly/tarcza-antyfraudowa-jak-zapobiegac-naduzyciom-w-czasie-kryzysu.html> (access: 28.08.2022); D.R. Hermanson, S. Justice, S. Ramammorti, S., Jr, R.A., Riley: Unique Characteristics of Predator Frauds, *Journal of Forensic Accounting Research*, In-Press, 2 (1)/2017, p. A31-A4, <https://doi.org/10.2308/jfar51747>

¹⁸ Ch.S. Armstrong, J.E. Core, D.J. Taylor, R.E. Verrecchia: When does information asymmetry affect the cost of capital, *Journal of Accounting Research*, 49, 1/2011, p. 140.

¹⁹ J. Oleński: *Ekonomika informacji. Metody, PWE, Warszawa 2003*; A. Blajer-Gołębiowska: Modelowanie niepełnej informacji za pomocą teorii gier, [in:] D. Kopycińska (ed.), *Działania ekonomiczne podmiotów rynkowych*, Wydawnictwo Katedry Mikroekonomii Uniwersytetu Szczecińskiego, Szczecin 2007, p. 1311-1329.

²⁰ G. Akerlof: The Market for Lemons: Qualitative Uncertainty and the Market Mechanism, *Quarterly Journal of Economics*, 84 (3)/1970, p. 488-500, <https://doi.org/10.2307/1879431>; A. Mirrles: Information and Incentives. The Economics of Carrots and Sticks, *The Economic Journal*, 107/1997, <https://doi.org/10.1111/j.1468-0297.1997.tb00050.x>; T. Bernat, K. Hawran, J. Kowalik: Asymetria informacji w modelu pryncypał-agent – wyniki badań eksperymentalnych, *Przedsiębiorstwo i Region*, 8/2016, p. 65-75, <https://doi.org/10.15584/pir.2016.8.7>; B. Wachnik: Model przyczynowy zjawiska asymetrii informacji w informatycznym przedsięwzięciu wdrożeniowym, *Annales Universitatis Mariae Curie-Skłodowska Lublin*, 52, 2/2018, p. 172-183. <https://doi.org/10.17951/h.2018.52.2.171-183>

²¹ B. Dorris: Coronavirus Pandemic is a Perfect Storm for Fraud, *ACFE*, 2020, <https://www.acfeinsights.com/acfe-insights/coronavirus-pandemic-is-a-perfect-storm-for-fraud> (access: 29.08.2022).

²² M. Miller: Global profiles of the fraudster: Technology enables and weak controls fuel the fraud, *KPMG*, 2016, <https://advisory.kpmg.us/articles/2017/global-profiles-of-the-fraudster.html> (access: 29.08.2022).

²³ J. Karpoff, D. Lee, G. Martin: The consequences to managers for financial misrepresentation, *Journal of Financial Economics*, 88 (2)/ 2008, p. 193-215, <https://doi.org/10.1016/j.jfineco.2007.06.003>

problem²⁴. Therefore, fraud detection should become a priority in organizations²⁵; however, anti-fraud systems cannot prevent every case of fraud. As part of identifying and diagnosing fraud, it is necessary to implement control mechanisms in the organization, including appropriate methods and techniques to reduce the risk of fraud²⁶. To this end, companies implement proactive and passive anti-fraud controls. The task of the former is to prevent a fraud situation, while the latter is to verify its causes and effects after the event. Proactive tools primarily include document examination, internal audit, management review, account reconciliation, surveillance/monitoring, and automated transaction/data monitoring. These are established at the organizational level; hence proper identification of risks and knowledge of their causes and effects are an important part of fraud risk management. On the other hand, as an example of passive tools, we should mention, among others: tips, internal audits, management reviews, document examination, by accidents, account reconciliation, automated transaction/data monitoring, external audits, surveillance/monitoring, notification by law enforcement, and confession. These mechanisms are oriented toward specific actions taken to detect a fraudulent act and assess its effects on the organization. Some of these mechanisms, such as internal audits, can be active and passive. The ACFE's research shows that much lower fraud losses are incurred by companies that have previously identified a fraudulent situation as a result of proactive internal mechanisms within the organization. This is in contrast to passive tools, resulting in longer-lasting patterns and greater financial losses for the organization²⁷.

Research methodology

The conducted research aims to analyze anti-fraud controls applied in Polish business entities. Anti-fraud controls verified based on research on the phenomenon of fraud conducted by the ACFE organization were taken as a reference. The choice of the published list was related to the high evaluation of the effectiveness of the indicated tools. For this purpose, ACFE reports for the years 2006-2022 were analyzed. The evaluation of the application of the indicated anti-fraud controls in Polish business entities conducted based on the example of the 20 largest listed companies on the Warsaw Stock Exchange included in the WIG20 Index. The study period covered a period from 2017-2021. The basic research method was quantitative and qualitative analysis.

The choice of entities included in the WIG20 Index was motivated by the fact that they are required to disclose information on actions taken to manage fraud risk. This is confirmed by the Principles of Corporate Governance for Supervised Institutions introduced by the Financial Supervision Commission and the Good Practices of Companies Listed on the GWP published by the Polish Stock Exchange. They indicate the need to put in place mechanisms for detecting, overseeing and notifying abuses, and applying procedures to prevent conflicts of interest²⁸. These entities are also required to implement the

²⁴ M. Bekiaris, G. Papachristou: Corporate and accounting fraud: Types, causes and fraudster's business profile, *Corporate Ownership & Control*, 15 (1-2)/2017, p.467-475, <http://doi.org/10.22495/cocv15i1c2p15>

²⁵ K.A. Adeyemo: Frauds in Nigerian Banks: Nature, Deep-Seated Causes, Aftermaths and Probable Remedies, *Mediterranean Journal of Social Sciences*, 3 (2)/2012, p. 279-289.

²⁶ A.A. Boateng, G.O. Boateng, H. Acquah: A Literature Review of Fraud Risk Management in Micro Finance Institutions in Ghana, *Research Journal of Finance and Accounting*, 5 (11)/2020, p. 42-29.

²⁷ Occupational Fraud 2022: A Report to the Nations, ACFE, Austin TX 2022, 6-65.

²⁸ Zasady ładu korporacyjnego dla instytucji nadzorowanych, Komisja Nadzoru Finansowego, 2014, https://www.knf.gov.pl/knf/pl/komponenty/img/knf_140904_Zasady_ladu_korporacyjnego_22072014_38575.pdf (access: 29.09.2022); *Dobre Praktyki Spółek Notowanych na GWP 2016, Giełda*

provisions of Article 49 of the Accounting Act, under which they are required to publish, as a part of their disclosure of non-financial information, a description of material risks associated with the company's operations that adversely affect its operating policies, including corrupt activities²⁹. However, none of these provisions specify exactly what mechanisms these should be. Thus, the catalog of legally binding instruments to reduce the risk of fraud is left to the discretion of business entities.

Reports were used as source material: Report of Occupational Fraud: A Report to the Nations for the Years 2006-2022 (published by the ACFE), and non-financial reports presenting information on anti-corruption published by the analyzed companies. The latter provides information on fraud prevention mechanisms, and the obligation to publish them has been imposed on market players since 2017. The beginnings of the reporting were not easy as they included very limited information on measures taken to mitigate the risk of fraud. Despite the fact that, at present, there is an apparent trend toward increasing information on fraud control mechanisms, this area still requires improvement on the part of the entities.

The qualitative assessment focused on the use and development of anti-fraud controls based on research conducted by the ACFE. The information obtained made it possible to verify the extent to which the analyzed group of market entities uses the indicated anti-fraud controls as mechanisms for reducing fraud and what the process of change in this regard has been over the period studied, which was used to conduct a quantitative analysis.

The results of the survey were used to assess the degree of use of fraud mitigation mechanisms. The publication is a continuation of a series of articles on fraud and abuse in companies, the tools used in their mitigation, and the disclosure of information about them.

Results

Control mechanisms to reduce the risk of fraud are anti-fraud controls, which are updated every two years by the ACFE organization in the form of published reports. Their development over the 2006-2022 period is shown in Table 1. This period takes into account three crises. The first, the economic crisis in the financial and banking markets which took place between 2007 and 2009, was initiated by the collapse of the high-risk mortgage market in the United States. The second covers 2014, when a conflict that was part of the Russian-Ukrainian war, which has been ongoing since 2014, took place. The third, which began in 2021 and was triggered by the COVID-19 pandemic, has been further aggravated since 2022 by the armed conflict in Ukraine. Its effects, which include growing disinformation (among other things), are already being felt.

The data in the table shows that the development of anti-fraud controls occurred only in 2008 – before that, the entities were limited to the use of classic mechanisms such as auditing and training. After 2008, there was a clear increase in the use of mechanisms, which again occurred in 2014. It is worth pointing out that both dates are critical because they cover the indicated periods of crisis situations which initiated the expansion of the catalog of anti-fraud controls in 2008 and 2014, respectively. In 2006, the list of anti-fraud

Papierów Wartościowych, 2016, p. 14, 18, https://www.gpw.pl/pub/GPW/files/PDF/GPW_1015_17_DOBRE_PRAKTYKI_v2.pdf (access: 29.09.2022).

²⁹ Ustawa z dnia 29 września 1994 roku o rachunkowości, Dz.U. 1994, nr 121, poz. 591 as amand., art. 49b ust. 2 pkt. 3 i 5.

tools used was relatively poor and limited to basic mechanisms, often driven by legal obligations. In 2008, entities significantly expanded the anti-fraud toolkit in use. In contrast, in 2014, new tools such as proactive data monitoring/analysis, a dedicated fraud department, function, or team and also formal fraud risk assessments were implemented. The data in the table indicates that mechanisms such as code of conduct and external audits are currently the most popular. At the same time, it should be noted that an external audit is a tool that most entities – especially market-based ones – are required to use under separate legal regulations.

Table 1. Popularity of the use of anti-fraud controls between 2006 and 2022 [%]

Anti-fraud control/ Percent	2006	2008	2010	2012	2014	2016	2018	2020	2022
Rewards for Whistleblowers		5	7	9	10	12	12	13	15
Job Rotation/Mandatory Vaca-		12	15	17	20	19	19	23	25
Surprise Audits	29	25	29	32	33	38	37	38	42
Anti-fraud Policy		36	39	47	45	50	54	56	60
Fraud training for employees	46	39	40	47	48	52	53	55	61
Fraud training for manag-		41	42	47	48	51	52	55	59
Hotline	45	43	49	54	54	60	63	64	70
Employee Support Programs		53	45	57	52	56	54	55	56
Independent Audit Committee		50	53	60	62	62	61	62	67
Management review		41	53	60	63	65	66	65	69
External audit of internal con-		54	59	67	65	68	67	68	71
Internal Audit/FE Department	59	56	66	68	71	74	73	74	77
Management of Certification		52	59	68	70	72	72	73	74
Code of Conduct		61	70	78	77	81	80	81	82
External audit	75	70	76	80	81	82	80	83	82
Proactive data monitor-					35	37	37	38	45
Dedicated fraud department,					39	41	41	44	48
Formal fraud risk assessments				35	33	39	41	41	46

Source: own elaboration based on ACFE Report of Occupation 2006-2022, <https://www.acfe.com/fraud-resources/report-to-the-nations-archive> (access: 28.08.2022).

A relatively low percentage of entities use surprise audits, job rotation/mandatory vacations, or rewards for whistleblowers. Low interest is also shown in new mechanisms that emerged after 2014. The ACFE's research shows that of the tools identified, tools such as job rotation/mandatory vacation and surprise audit are the most effective in minimizing fraud losses. Unfortunately, these are the least popular among entities³⁰, although an increase in their use is evident over the years analyzed. Mechanisms such as anti-fraud policy, fraud training for employees, hotline, management review, management of certification of F/S and code of contact have also gained in popularity. In 2022, they showed more than a 20% increase in use compared to 2008. The above indicates that entities are implementing anti-fraud controls, with some more popular and others less so. However, only the use of all types of anti-fraud controls is associated with the lowest median of fraud losses, according to the ACFE.

Taking into account the analysis presented, the use of the indicated anti-fraud controls in Polish business entities listed on the Warsaw Stock Exchange as part of the WIG20

³⁰ Occupational Fraud 2022: A Report to the Nations, ACFE, Austin TX 2022, p. 6-65.

Index was verified. However, it should be noted that concerning Polish entities, there is an apparent problem with the disclosure of this type of information. Hence, the analysis covered 2017-2021, when the non-financial reporting obligation was introduced. Since then, there has been an increase in the number of disclosures on fraud mitigation tools, which may be a consequence of the establishment of the non-financial reporting obligation and increased information awareness on the part of entities, as well as the need for their implementation. However, drawing definitive conclusions on progress in this regard is somewhat difficult due to the unclear reporting system, resulting from the lack of clear guidelines for separating the area of fraud risk management and the failure to maintain uniformity in this regard. The results of the analysis are shown in Table 2.

Table 2. Application of selected anti-fraud controls in Polish entities included in the WIG20 Index in 2017-2021 [%]

Anti-fraud control/Percent of cases	2017	2018	2019	2020	2021
Rewards for Whistleblowers	5	5	5	5	5
Job Rotation/Mandatory Vacation	0	5	5	5	5
Surprise Audits	10	5	10	5	10
Anti-fraud Policy	90	90	90	100	100
Fraud training for employees	90	90	90	90	90
Fraud training for managers/executives	90	90	95	95	95
Hotline	15	20	30	45	45
Employee Support Programs	10	10	35	20	40
Independent Audit Committee	85	90	100	100	100
Management review	55	55	60	60	60
External audit of internal controls over financial	5	5	5	15	20
Internal Audit/FE Department	80	80	85	95	95
Management of Certification of Financial State-	100	100	100	100	100
Code of Conduct	95	100	100	100	100
External audit	100	100	100	100	100
Proactive data monitoring/analysis	70	80	90	90	90
Dedicated fraud department, function, or team	20	20	30	50	60
Formal fraud risk assessments	50	55	60	70	80

Source: own elaboration based on reports and statements on non-financial information published in 2017-2021 by companies included in the WIG20 Index

The data in Table 2 shows that the surveyed entities are taking measures to reduce the risk of fraud by implementing anti-fraud controls. However, not all of them are used. The most popular among the surveyed entities are an anti-fraud policy, an independent audit committee, a code of conduct, and an external audit. It is worth noting, however, that in addition to the anti-fraud policy, the other two are required by external regulations for listed entities to apply. The dominant item under anti-fraud controls is training for managers and employees. For years, there has been a definite trend toward undertaking preventive methods in the form of training, meetings and general education on fraud risk reduction. Almost all entities have established an independent audit committee within their structures. Also, a significant number of respondents apply proactive data monitoring/analysis and as many managements of certification of financial statements. The former involves verifying data and information to prevent fraud, while the latter means that

a certified independent auditor has audited and signed the financial statement. A significant number of entities have an audit department, but most have not indicated whether so-called “surprise audits” are conducted.

The data presented show that the overwhelming majority of respondents have a whistleblowing system in their structures. The same is true of the hotline system, which, as a rule, applies to whistleblowing. It should be pointed out that a fairly significant number of entities have implemented procedures to protect whistleblowers; however, most of them do not use a reward system for whistleblowing. It is worth pointing out that, with regard to whistleblowing, the greatest progress in its implementation into organizational structures occurred with the enactment of Directive (EU) 2019/1937 of the European Parliament and of the Council of October 23, 2019³¹, on the protection of whistleblowers, which was almost immediately reflected in the reports of the entities. While in 2017 there was a noticeable lack of implementation of whistleblowing in organizations, in 2019 there was already a clear increase in the use of this tool by 15% and, in 2021, by 30% compared to 2017. The adoption of tools such as hotlines and employee support programs followed this.

During the period under review, dedicated fraud departments also became more important. However, it is noteworthy that this function was also assigned as an additional function to audit or compliance departments. Only a few entities established separate fraud departments. Regarding job rotation/mandatory vacation mechanisms, it should be noted that these tools have a very low degree of application in the surveyed entities. Although the companies show staff turnover rates, they do not relate to minimizing the risk of fraud.

The survey showed that the investigated group of Polish entities is taking measures to reduce the risk of fraud. The development of anti-fraud controls is also visible, which, from the perspective of the progress of fraudulent methods and techniques, should be evaluated positively. The recurrence of crisis situations has taught us that we cannot remain passive in emerging crises and their consequences and accompanying consequences of fraud.

Conclusions

Fraud is a common occurrence in the economy. The effect of its impact on companies is different and further compounded by crises. Therefore, it is necessary to take appropriate measures in the form of anti-fraud controls, which cannot always prevent the occurrence of a fraud situation, but at least mitigate its effects. An assessment of the degree of application of selected anti-fraud controls was carried out for 20 companies listed on the WSE within the WIG20. They constitute a group of the largest companies with the highest liquidity. Hence, their selection was not coincidental as they should exhibit the highest level of protection against fraud risk and, therefore, be best equipped with controls. The analyses carried out showed that the entities use the anti-fraud controls under study as mechanisms to mitigate the risk of fraud. This implies the maturity of businesses in the face of the growing scale of fraud, thus recognizing the need to take measures to strengthen the company's defense system against fraud and manipulation. However, what is noticeable concerning Polish business entities is the lack of transparency and uniformity in the

³¹ Dyrektywa Parlamentu Europejskiego i Rady 2014/95/UE z dnia 22 października 2014 r. zmieniająca dyrektywę 2013/34/UE w odniesieniu do ujawniania informacji niefinansowych i informacji dotyczących różnorodności przez niektóre duże jednostki oraz gupy, Dz.Urz UE 15.11.2014, L. 33/1.

disclosure of information on fraud risk management. The control mechanisms that are implemented in business entities are, as a rule, integrated into other elements of the organizational structure. This should not be pointed out as inappropriate, but only hindering the acquisition of relevant information. Given its growing scale, reporting on fraud risk should be a separate item of reports. Yet, the tools analyzed, even if used, are not necessarily applied as the result of a focus on the problem, which is the need to reduce the risk of fraud. Hence, it is necessary to strive for transparency of published information. Moreover, the prevalence of fraud indicates the legitimacy of permanently including this issue in economic theory research and undertaking research aimed at counteracting it. This should be reflected in corporate reporting.

The advent of mandatory non-financial reporting has, in a way, obliged companies to apply the information about the control mechanisms to the risk of fraud public. Although the information they include on this subject is not yet comprehensive, as it is limited to indicating general data, there is also a lack of feedback on their effectiveness. Yet, striving to raise community awareness and ensuring independence in reporting on performance is extremely important in shaping a positive image of the organization. Entities should not forget to build airtight internal control systems based on adequate and effective controls. However, the lack of sufficient internal protection, low effectiveness of internal control and audit instruments causes the amount of fraud to remain continually high. The accompanying mood of the international situation, including the volatility of economic and business factors, exacerbates the phenomenon of fraud and abuse. In addition, it is necessary to consider the determinants of social and technological development, as well as the intensifying processes of globalization, internationalization and, in particular, the liberalization of capital flows – which make it easier for fraudsters to access knowledge, information, or data. This raises the question of whether, when fully equipped with all the anti-fraud controls analyzed, business entities will be sufficiently protected from the consequences of fraud, which may be a result of the current or upcoming crisis. This question will be answered in the course of further research conducted in the coming years. However, taking into consideration the significant progress in the development of anti-fraud controls, it should be noted that organizations are certainly much more prepared to protect themselves against the risk of fraud than in previous years. The coming years will be a test for the adequacy and effectiveness of the anti-fraud controls developed over the years. It is worth noting that a significant part of them was shaped by legal regulations and guidelines, while others were the result of operators' own experiences and actions. Thus, neither state legislatures, standardization organizations, nor economic operators can remain indifferent to further improvement of anti-fraud controls as the current ones may prove insufficient in view of the effects of the ongoing crisis.

References

- ACFE Report of Occupation 2006-2022, <https://www.acfe.com/fraud-resources/report-to-the-nations-archive> (access: 28.08.2022).
- Adeyemo, K. A.; Frauds in Nigerian Banks: Nature, Deep-Seated Causes, Aftermaths and Probable Remedies, *Mediterranean Journal of Social Sciences*, 3 (2)/2012, p. 279-289.

- Akerlof A. G., Shiller R. J., Shiller, R.: *Animal Spirits: How Human Psychology Drives the Economy, and Why It Matters for Global Capitalism*, Princeton University, Princeton 2009.
- Akerlof G.: The Market for Lemons: Qualitative Uncertainty and the Market Mechanism, *Quarterly Journal of Economics*, 84 (3)/1970, p. 488-500.
- Akerlof G.A., Shiller R. J.: *Złować frajera. Ekonomia manipulacji i oszustwa* wyd. 2, Polskie Towarzystwo Ekonomiczne, Warszawa 2021.
- Armstrong Ch.S., Core J.E., Taylor D.J., Verrecchia R.E.: When does information asymmetry affect the cost of capital, *Journal of Accounting Research*, 49, 1/2011, p. 1-140.
- Bekiaris M., Papachristou G.: Corporate and accounting fraud: Types, causes and fraudster's business profile, *Corporate Ownership & Control*, 15 (1-2)/2017, p.467-475, <http://doi.org/10.22495/cocv15i1c2p15>
- Bernat T., Hawran K., Kowalik J.: Asymetria informacji w modelu pryncypał-agent – wyniki badań eksperymentalnych, *Przedsiębiorstwo i Region*, 8/2016, p. 65-75, <https://doi.org/10.15584/pir.2016.8.7>
- Blajer-Gołębiowska A.: Modelowanie niepełnej informacji za pomocą teorii gier, [in:] D. Kopycińska (ed.), *Działania ekonomiczne podmiotów rynkowych*, Wydawnictwo Katedry Mikroekonomii Uniwersytetu Szczecińskiego, Szczecin 2007, p. 58-67.
- Boateng A.A, Boateng G.O, Acquah H., A Literature Review of Fraud Risk Management in Micro Finance Institutions in Ghana, 5(11) November 2020, *Research Journal of Finance and Accounting*. : A Literature Review of Fraud Risk Management in Micro Finance Institutions in Ghana, *Research Journal of Finance and Accounting*, 5 (11)/2020, p. 42-52.
- Bochenek M.: Lekcja z historii kryzysów gospodarczych na świecie, *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 39, 1/2009, p. 54-62.
- Bochenek M.: Rozważania historyczno-semantyczne na temat kryzysów ekonomicznych, *Acta Universitatis Nicolai Copernici, Ekonomia*, 63, 2/2012, p. 147-159.
- Dyrektywa Parlamentu Europejskiego i Rady 2014/95/UE z dnia 22 października 2014 r. zmieniająca dyrektywę 2013/34/UE w odniesieniu do ujawniania informacji niefinansowych i informacji dotyczących różnorodności przez niektóre duże jednostki oraz gupy, Dz.Urz UE 15.11.2014, L. 33/1.
- Dobre Praktyki Spółek Notowanych na GWP 2016, *Giełda Papierów Wartościowych*, 2016, p. 1-24, https://www.gpw.pl/pub/GPW/files/PDF/GPW_1015_17_DOBRE_PRAKTYKI_v2.pdf (access: 28.08.2022).
- Dopfer K.: The Economic Agent as Rule Maker and Rule User: Homo Sapiens, *Economicus*, *Journal of Evolutionary Economics*, 14/2004, p. 177-195.
- Dorris B.: Coronavirus Pandemic is a Perfect Storm for Fraud, *ACFE*, 2020, <https://www.acfeinsights.com/acfe-insights/coronavirus-pandemic-is-a-perfect-storm-for-fraud> (access: 29.08.2022).
- Dunn S.P., Pressman S.: The Economic Contributions of John Kenneth Galbraith, *Review of Political Economy*, 17, 2/2005, p. 161-209.
- Dzionek-Kozłowska J., *Model homo economicus. Geneza, ewolucja wpływ na rzeczywistość gospodarczą*, Wydawnictwo Uniwersytetu Łódzkiego, Łódź 2018.
- Global profiles of the fraudster: Technology enables and weak controls fuel the fraud, *KPMG*, 2016, <https://advisory.kpmg.us/articles/2017/global-profiles-of-the-fraudster.html> (access: 28.09.2022).

- Hermanson, D. R., Justice, S., Ramammorti, S., & Riley Jr, R. A.: Unique Characteristics of Predator Frauds, *Journal of Forensic Accounting Research*, In-Press, 2 (1)/2017, p. A31-A4, <https://doi.org/10.2308/jfar51747>
- Issing O.: The COVID-19 crisis: A Hamilton moment for the European Union? *International Finance* 2020, p. 340-347, <https://doi.org/10.1111/infi.12377>
- Karpoff, J., Lee, D., Martin, G.: The consequences to managers for financial misrepresentation, *Journal of Financial Economics*, 88 (2)/ 2008, p. 193-215, <https://doi.org/10.1016/j.jfineco.2007.06.003>
- Kutera M.: Nadużycia finansowe. Wykrywanie i zapobieganie, Difin, Warszawa 2016.
- Mączyńska E., Mączyńska E.: Kryzysy jako impulsy zmian systemów społeczno-gospodarczych, *Mazowsze Studia Regionalne*, Mazowieckie Biuro Planowania Regionalnego w Warszawie, 37, 2/2021, p. 11-32.
- Mączyńska E.: Niezbywalne funkcje państwa – refleksje wokół książki G.A. Akerlofa i R.J. Shillera pt. Zławić frajera. *Ekonomia manipulacji i oszustwa*, PTE, Warszawa 2017.
- Marmot M., Bloomer E., Goldblatt P.: The Role of Social Determinants in Tackling Health Objectives in a Context of Economic Crisis, *Public Health Reviews*, 9/2013, p. 1-24.
- Mirrles A.: Information and Incentives. The Economics of Carrots and Sticks, *The Economic Journal*, 107/1997, <https://doi.org/10.1111/j.1468-0297.1997.tb00050.x>
- Occupational Fraud 2022: A Report to the Nations, ACFE, Austin TX 2022.
- Occupational Fraud: A Study of the Impact of an Economic Recession, ACFE, Austin TX 2019.
- Oleński J.: *Ekonomika informacji. Metody*, PWE, Warszawa 2003.
- Omar N., Johari Z.A., Hasnan S.: Corporate Culture and the Occurrence of Financial Statement Fraud: A Review of Literature, *Procedia Economics and Finance*, 31/2015, p. 367-372.
- Rist G.: *The History of development. From western origin to global faith*, Zed Books, London, New York 2014.
- Słomski D.: Takiej kumulacji zagrożeń dla biznesu nie było od lat 80. Oto sześć głównych powodów, *Business Insider*, 2022, <https://businessinsider.com.pl/biznes/glowne-problemy-przedsiębiorców-takiej-kumulacji-nie-było-od-lat-80/xm98tn8> (access: 28.08.2022).
- Tarcza antyfraudowa – jak zapobiegać nadużyciom w czasie kryzysu?, PwC, 2020, <https://www.pwc.pl/pl/artykuly/tarcza-antyfraudowa-jak-zapobiegac-nadużyciom-w-czasie-kryzysu.html> (access: 28.08.2022).
- Ustawa z dnia 29 września 1994 roku o rachunkowości, Dz.U. 1994, nr 121, poz. 591 as amand., art. 49b ust. 2 pkt. 3 i 5.
- Wach K.: Od człowieka racjonalnego do emocjonalnego. Zmiana paradygmatu nauk ekonomicznych, *Horyzonty Wychowania*, 9 (17)/2010, p. 95-105.
- Wachnik B.: Model przyczynowy zjawiska asymetrii informacji w informatycznym przedsięwzięciu wdrożeniowym, *Annales Universitatis Mariae Curie-Skłodowska Lublin*, 52, 2/2018, p. 172-183. <https://doi.org/10.17951/h.2018.52.2.171-183>
- Zasady ładu korporacyjnego dla instytucji nadzorowanych, Komisja Nadzoru Finansowego, 2014, https://www.knf.gov.pl/knf/pl/komponenty/img/knf_140904_Zasady_ladu_korporacyjnego_22072014_38575.pdf (access: 28.08.2022).

Ryzyko oszustw w czasach kryzysu i rozwój narzędzi je ograniczających

Streszczenie

Zjawisko oszustw towarzyszy organizacjom od początku ich istnienia. Jego skala i częstotliwość występowania zmienia się wraz z sytuacją ekonomiczną, prawną i gospodarczą zachodzącą na rynkach krajowym i międzynarodowym. Czynnikiem sprzyjającym jego eskalacji są sytuacje kryzysowe, których determinant należy upatrywać zarówno w czynnikach zewnętrznych, jak i wewnętrznych. Stąd celem ograniczenia prawdopodobieństwa występowania i skutków oddziaływania ryzyka oszustw na organizację, należy podejmować odpowiednie działania i wdrażać mechanizmy kontrolne. Celem publikacji jest analiza rozwoju mechanizmów ograniczania oszustw i nadużyć, zdiagnozowanych na podstawie cyklicznych badań zjawiska oszustw, prowadzonych przez organizację ACFE w latach 2006-2022 oraz ocena stopnia ich zastosowania w polskich podmiotach gospodarczych. Podstawową metodą badawczą była analiza ilościowa i jakościowa. Przeprowadzone analizy wykazały, że podmioty wykorzystują badane mechanizmy ograniczania ryzyka oszustw i nadużyć. Jednakże powszechność ich zastosowania postępuje stosownie do wdrażanych regulacji prawnych i wytycznych. Oznacza to, że działalność instytucji i organizacji państwowych oraz międzynarodowa ma znaczący wpływ na rozwój mechanizmów ograniczania oszustw i nadużyć.

Słowa kluczowe: oszustwo, ryzyko oszustw, zarządzanie ryzykiem oszustw, kryzys

Kody JEL: D81, D82, D84, D85

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AN ASSESSMENT OF THE SHARE OF REAL ESTATE TAX REVENUES IN THE BUDGET REVENUES OF SELECTED POLISH CITIES FROM 2018-2021

The publication aimed to assess the share of property tax revenue in the overall budget revenues of Poland's 14 largest cities with populations over 200,000. Property tax rates were also assessed. Property tax is one of the key local taxes collected by the local government. The assessment was carried out using the analytical method, inference method, source document research method, and a literature review. The results of the study indicate that property tax revenues, depending on the city, accounted for between 6.31% (in Warsaw) and 13.98% (in Gdańsk) of the share in total revenues to the city budget. On average, it can be concluded that the real estate tax accounts for approximately 9% of the total income in the budget of the largest cities in Poland. It has also been established that the level of revenue depends on the tax rates. In addition, it was found that there is significant variation between Poland's largest cities in the share of property tax revenue in total budget revenue.

Keywords: property tax, public finance, Local Government Revenue

JEL Codes: H71; H83

Introduction

As important growth poles, the largest cities attract new residents and economic actors. Cities perform various important functions and are the location of public services in different areas such as health care, education, labor market, tertiary services, etc. The development of individual cities is linked to urbanization. The process of urbanization involves the integration of the space on which productive activities, services and the lives of its inhabitants are concentrated. The largest urban agglomerations accumulate in their space economic and social phenomena¹. Ensuring efficient management and optimum development of a given city is the responsibility of the public authorities at the local government level. The Polish legal system has defined the tasks and competencies of local government at the local level. At present, there is a municipal government at the city level² and, in the case of selected cities, also a county government (so-called "district cities")³. According to legal regulations, local public authorities in Poland have a number of powers that enable them to develop and ensure their day-to-day functioning.

The decentralization of public authority at the local government level carried out in Poland has contributed to granting them a high degree of autonomy in decision-making

¹ D. Stawasz: Współczesne dylematy zarządzania rozwojem miast. Akademia samorządowa, Uniwersytet Łódzki, Łódź 2016, p. 17-18.

² Ustawa z dnia 8 marca 1990 roku o samorządzie gminnym, Dz.U. z 2022 r. poz. 559.

³ Ustawa z dnia 5 czerwca 1998 r. o samorządzie powiatowym, Dz.U. z 2022 r. poz. 1526.

and the creation of socio-economic policies in urban areas⁴. The adopted legal solutions in Poland have also defined a catalog of tasks for which the city's self-government authorities are responsible at the municipal level, as well as cities with district rights. The efficient functioning of the city and provision of public services to its inhabitants requires appropriate financial outlays⁵. Funds for the execution of tasks by the local self-government are spent from the collected revenues defined by the relevant legal regulations⁶. The catalog of revenues of local self-government in Poland is defined in the Act of 2003 on revenues of local self-government units⁷. These include revenues and foreign revenues, including those received from the state budget (subsidies and grants). The funds raised by the local government from public tributes are used to perform the tasks entrusted to it and to ensure the welfare of the city's residents⁸. The public tributes that constitute the revenue of local governments include both local taxes and local levies. Local governments, as part of their own revenues, also have their share of income from income taxes on individuals and business entities. The system of financing local government in Poland is extensive and includes several different public tributes⁹.

Public funds raised from revenue enable municipalities to finance many public goods, the provision of which is a key task of the city government (e.g., education, public transport)¹⁰. City authorities can only provide public goods from the available financial resources collected within the city budget. The efficiency of the city's performance depends on the funds raised for the budget, so the analysis of the selected local tax is an important area for assessing the financial management of local authorities¹¹.

This article aims to assess the level of the share of property tax revenue in the overall budget revenues of the largest cities in Poland. Real estate tax is one of the basic local taxes constituting the local government's income. The analysis of the share of property tax has been carried out based on the income of Poland's largest cities with populations over 200,000. In addition, an analysis of the property tax rates applicable in each city was carried out. An assessment of the level of the share of property tax in the income of cities may indicate possible differences between the budgets of Poland's largest cities.

Property tax

Property tax, in its various forms, is a source of revenue for the state and local governments in many countries worldwide. It should be regarded as an important public tribute which, in addition to providing revenue for the budget, also plays a significant social role. It is associated with the taxation of the tangible assets of people who own significant goods

⁴D. Stawasz: Współczesne miasta. Aktualne możliwości rozwoju. Akademia samorządowa, Uniwersytet Łódzki, Łódź 2020, p. 97-98.

⁵J.E. Stiglitz, J.K. Rosengard: Economics of the public sector, W.W. Norton Company, New York, London 2015, p. 197-199.

⁶M. Podstawka: Podstawy finansów. Teoria i praktyka, Wydawnictwo SGGW, Warszawa 2011, p. 139-143.

⁷Ustawa z dnia 13 listopada 2003 roku o dochodach jednostek samorządu terytorialnego, Dz.U. z 2021, poz. 1672 as amand.

⁸C. Farvacque-Vitkovic, M. Kopanyi: Municipal Finances. A Handbook for Local Governments, International Bank for Reconstruction and Development, The World Bank, Washington DC 2014, p. 33.

⁹E. Rudowicz: Dochody jednostek samorządu terytorialnego, [in:] M. Podstawka (ed.), Finanse Instytucje Instrumenty Podmioty Rynki Regulacje, Wydawnictwo PWN, Warszawa 2010, p. 155-176.

¹⁰I. Toshihiro: Principles of Public Finance Springer Science Business Media, Singapore 2017, p. 295-296.

¹¹C. Szydłowski: Audyt dochodów z tytułu opłaty miejscowej w wybranych gminach województwa pomorskiego w Polsce, Polityki Europejskie, Finanse i Marketing, 23 (72)/2020, p. 208-221.

and makes it possible to reduce the differences between the incomes of the various social classes of a country¹². Property tax is levied on both individuals and businesses.

The system for determining the tax base and collecting property tax depends on the legal arrangements in each country. Most countries levy real estate tax; however, there are key differences in determining the system of its collection and the subject of taxation¹³. Poland uses the surface area of a given property as the subject of property taxation. An exception is structures where the tax base is a percentage of its value – some countries use a different basis for property taxation based on the cadastral value of the property in question. The taxable basis, in this case, is the value of the real property on which its owner is obliged to pay tax, being a specified percentage of its value¹⁴. Cadastral tax is a complex system as it requires the public authorities entitled to collect it to keep appropriate records of all properties, together with ongoing updating of their value. It is worth noting that in Poland, for many years, work has been underway on the possibility of introducing a cadastral tax¹⁵. The rules of real estate taxation are set out in the laws on local taxes and charges levied by the local government¹⁶. The amount of the property tax rate for a given year is determined by a resolution of the municipal council (city council). The municipal council may set the real estate tax rates for a given tax base no higher than those set for a given year by the Minister of Finance in a relevant announcement. The legal regulations clearly define the basis for the real estate tax in Poland¹⁷.

The maximum property tax rates set by the Minister of Finance for each tax base in 2018-2021 are shown in Table 1.

The maximum property tax rates shown in Table 1 may be set by the city council at a lower rate, depending on the budgetary needs of the city concerned¹⁸. The dynamics of changes in the maximum property tax rates for a given tax base indicate that they were below 5% in the period under review. An unchanged, fixed tax rate (2% of value) was in force in the surveyed period for structures as its amount depends on their value. It is worth noting that the highest rate of property tax is set for buildings related to business activities.

The property tax in Poland is one of several local taxes and fees collected by municipalities. However, it is an important source of revenue for municipalities, which can also be used to implement local economic policy. Local authorities also have a share in corporate and personal income taxes. City authorities can encourage economic entities to locate their investments by setting property tax rates. Low property tax rates can also encourage individuals to settle in a city or invest in property¹⁹.

¹² J. Gruber: *Public Finance and Public Policy*, fifth edition, Worth Publishers, New York 2016, p. 279-280.

¹³ E. Slack: *The Property Tax – in Theory and Practice*, IMFG Paperson Municipal Finance and Governance, 2/2011, p. 2-4.

¹⁴ K. Świąteczak: *Podatek powierzchniowy czy katastralny – system opodatkowania nieruchomości w Polsce*, [in:] A. Borcuch, A. Krzysztofek (eds), *Ekonomia, finanse i zarządzanie. Problemy teoretyczne i praktyczne*, AT Wydawnictwo, Kraków 2019, p. 227-228.

¹⁵ L. Etel: *Reforma opodatkowania nieruchomości w Polsce*, Temida 2, Białystok 1998, p. 220-242.

¹⁶ Ustawa z dnia 12 stycznia 1991 roku o podatkach i opłatach lokalnych, Dz.U. z 2022 r. poz. 1452, art. 2-7.

¹⁷ K. Koślicki: *Opodatkowanie budowli podatkiem od nieruchomości*, Wolters Kluwer Polska, Warszawa 2022, p. 20-25.

¹⁸ P. Felis, H. Roslaniec: *Wykorzystanie podatku od nieruchomości w lokalnej polityce podatkowej miast Unii Metropolii Polskich*, *Gospodarka Narodowa*, 2/2017, p. 45-67.

¹⁹ P. Collier, E. Glaeser, T. Venables, M. Blake, P. Manwaring: *Land and property taxes for municipal finance*, The International Growth Centre, 2018, <https://www.theigc.org/wp-content/uploads/2017/08/Land-and-Property-Taxes-for-Municipal-Finance-06.07.18.pdf> (access: 18.10.2022).

Table 1. Maximum property tax rates for 2018-2021 are determined by the Minister of Finance by the announcement on upper limits of the amount rates of local taxes and charges for a given year

Tax base for property tax (pursuant to the Act of 12 January 1991 on local taxes and charges).	Maximum tax rate in PLN and in % in a given year				Annual % change in tax rates		
	2018	2019	2020	2021	2019/2018	2020/2019	2021/2020
Land related to business activities, irrespective of the way it is classified in the land and building register, per 1m ² of surface area.	0.91	0.93	0.95	0.99	102.20	102.15	104.21
Land under stagnant surface waters or flowing surface waters of lakes and artificial reservoirs from 1ha.	4.63	4.71	4.80	4.99	101.73	101.91	103.96
Other land, including land occupied for the conduct of paid statutory public benefit activity by public benefit organizations per 1m ² area.	0.48	0.49	0.50	0.52	102.08	102.04	104.00
Undeveloped land included in the revitalization area referred to in the Act of 9 October 2015 on revitalization (Journal of Laws of 2017, Item 1023), per 1m ² of area.	3.04	3.09	3.15	3.28	101.64	101.94	104.13
Residential buildings (or parts thereof) per 1m ² of floor area.	0.77	0.79	0.81	0.85	102.60	102.53	104.94
Buildings (or parts thereof) related to business activities and on residential buildings or parts thereof occupied for business activities per 1m ² of useful floor area.	23.10	23.47	23.90	24.84	101.60	101.83	103.93
Buildings (or parts thereof) occupied for the commercial activity of marketing certified seed per 1m ² of usable area.	10.80	10.98	11.18	11.62	101.67	101.82	103.94
Buildings (or parts thereof) related to the provision of health services within the meaning of the regulations on medical activity, occupied by the entities providing these services per 1m ² of usable area.	4.70	4.78	4.87	5.06	101.70	101.88	103.90
Other buildings (or parts thereof), including those occupied for the conduct of paid statutory public benefit activity by public benefit organizations per 1m ² of usable area.	7.77	7.90	8.05	8.37	101.67	101.90	103.98
Buildings – a percentage of their value as defined pursuant to Article 4(1)(3) and (3) to (7) of the Act of 12 January 1991 on Local Taxes and Fees.	2%	2%	2%	2%	100	100	100

Source: own elaboration based on the announcement of the Obwieszczenie Ministra Rozwoju i Finansów z dnia 28 lipca 2017 r. w sprawie górnych granic stawek kwotowych podatków i opłat lokalnych w 2018 r., M.P. z 2017, poz. 800; Obwieszczenie Ministra Finansów z dnia 25 lipca 2018 r. w sprawie górnych granic stawek kwotowych podatków i opłat lokalnych na rok 2019, M.P. z 2018, poz. 745; Obwieszczenie Ministra Finansów z dnia 24 lipca 2019 r. w sprawie górnych granic stawek kwotowych podatków i opłat lokalnych na rok 2020, M.P. z 2019 r., poz. 738; Obwieszczenie Ministra Finansów z dnia 23 lipca 2020 r. w sprawie górnych granic stawek kwotowych podatków i opłat lokalnych na rok 2021, M.P. z 2020, poz. 673.

Research methodology

The primary objective of the study was to determine the share of property tax revenue in total revenue to the budgets of the largest cities in Poland in 2018-2021. The first stage of the study was an analysis of property tax rates. This was followed by an assessment of the share of property tax revenues in total revenues to the budgets of the analyzed cities. The analysis was carried out based on the 14 largest cities in Poland in terms of population (i.e., for cities with more than 200,000 inhabitants in the years 2018-2021). The local government units selected for the analysis are, at the same time, cities with county rights, which made it possible to standardize their comparison in terms of organizational and legal form.

The research for the publication was conducted using the analytical method, the method of inference, the method of examining source documents, and a literature review. The analysis of the assessment of the level of expenditures from the budgets of selected Polish cities was carried out based on data contained in local legal acts defining property tax rates and reports on the implementation of the budgets of individual local government units for 2018-2021 published in Public Information Bulletins. The assessment performed was aimed at verifying the hypothesis that the level of revenue to the budget from property tax is dependent on property tax rates.

Results

An examination of the level of revenue to the municipal budget from property tax requires an analysis of property tax rates. Table 2 presents a summary of key property tax rates applicable in 14 Polish cities. The analysis includes property tax rates levied on selected property tax bases. Property tax is levied on both businesses and economic entities.

Table 2. Property tax rates from 2018 to 2021 in the cities analyzed

The city of/Tax base for property tax (pursuant to the Act of 12 January 1991 on local taxes and charges:	Tax rate in PLN and in % in a given year			
	2018	2019	2020	2021
Tax base for property tax (pursuant to the Act of 12 January 1991 on local taxes and charges):				
1. Land related to business activities, irrespective of the way it is classified in the land and building register, per 1m ² of surface area.				
Białystok	0.84	0.84	0.90	0.95
Bydgoszcz	0.91	0.93	0.95	0.99
Częstochowa	0.89	0.92	0.95	0.99
Gdańsk	0.91	0.93	0.95	0.99
Gdynia	0.91	0.93	0.95	0.99
Katowice	0.85	0.85	0.89	0.96
Kraków	0.91	0.91	0.95	0.99
Lublin	0.91	0.91	0.95	0.95
Łódź	0.91	0.93	0.95	0.99
Poznań	0.91	0.93	0.95	0.99
Radom	0.83	0.83	0.83	0.83
Szczecin	0.91	0.91	0.95	0.99
Warszawa	0.91	0.93	0.95	0.99
Wrocław	0.89	0.93	0.95	0.99
1.1. Land associated with business activities, located in residential areas and marked in the land and building register with the symbol "dr", providing access to residential buildings				
Wrocław	0.47	0.49	0.50	0.52

cont. Table 2

1.2. Land occupied for the pursuit of economic activities in the field of physical culture and sport per 1m ² of surface area.				
Kraków	0.27	0.27	0.28	0.30
1.3. Land occupied for the operation of a zoo business per 1m ² of surface area.				
Kraków	-	-	0.28	0.30
2. Other lands, including land occupied for the conduct of paid statutory public benefit activity by public benefit organizations per 1m ² area.				
Białystok	0.45	0.45	0.50	0.52
Bydgoszcz	0.48	0.49	0.50	0.52
Częstochowa	0.47	0.49	0.50	0.52
Gdańsk	0.48	0.48	0.50	0.52
Gdynia	0.48	0.49	0.50	0.52
Katowice	0.40	0.40	0.42	0.47
Kraków	0.48	0.48	0.50	0.52
Lublin	0.48	0.48	0.49	0.49
Łódź	0.48	0.49	0.50	0.52
Poznań	0.48	0.49	0.50	0.52
Radom	0.40	0.40	0.40	0.40
Szczecin	0.46	0.46	0.50	0.52
Warszawa	0.48	0.49	0.50	0.52
Wrocław	0.47	0.49	0.50	0.52
2.1 Land occupied for the conduct of paid statutory public benefit activities by public benefit organizations per 1m ² area.				
Kraków	0.34	0.34	0.35	0.36
3. Residential buildings (or parts thereof) per 1m ² of floor area.				
Białystok	0.73	0.73	0.80	0.85
Bydgoszcz	0.77	0.79	0.81	0.85
Częstochowa	0.70	0.73	0.81	0.85
Gdańsk	0.77	0.77	0.81	0.85
Gdynia	0.77	0.79	0.81	0.85
Katowice	0.70	0.70	0.73	0.80
Kraków	0.77	0.77	0.81	0.85
Lublin	0.77	0.77	0.79	0.79
Łódź	0.77	0.79	0.81	0.85
Poznań	0.77	0.79	0.81	0.85
Radom	0.57	0.57	0.57	0.57
Szczecin	0.70	0.70	0.81	0.85
Warszawa	0.77	0.79	0.81	0.85
Wrocław	0.75	0.79	0.80	0.85

cont. Table 2

4. Buildings (or parts thereof) related to business activities and on residential buildings or parts thereof occupied for business activities per 1m ² of useful floor area.				
Białystok	22.36	22.36	23.30	24.40
Bydgoszcz	23.10	23.47	23.90	24.84
Częstochowa	21.69	22.35	23.90	24.84
Gdańsk	23.10	23.47	23.90	24.84
Gdynia	23.10	23.47	23.90	24.84
Katowice	22.99	22.99	23.90	24.84
Kraków	23.10	23.10	23.90	24.84
Lublin	22.76	22.76	23.18	23.18
Łódź	23.10	23.47	23.90	24.84
Poznań	23.00	23.47	23.90	24.84
Radom	21.90	21.90	21.90	21.90
Szczecin	23.10	23.10	23.90	24.84
Warszawa	23.10	23.47	23.90	24.84
Wrocław	22.66	23.47	23.89	24.84
4.1. Buildings (or parts thereof) related to business activities and on residential buildings or parts thereof occupied for business activities per 1m ² of useful floor area – occupied for the purpose of carrying out economic activities in listed industries protected and declining industries.				
Kraków	11.55	11.55	11.95	12.42
4.2. Buildings (or parts thereof) related to business activities and on residential buildings or parts thereof occupied for the conduct of business activities per 1m ² of the usable area - the property tax rate in the case of running holiday resorts on a seasonal basis, continuously for a period of less than 6 months				
Gdańsk	16.60	16.80	18.00	18.70
5. Other buildings (or parts thereof), including those occupied for the conduct of paid statutory public benefit activity by public benefit organizations per 1m ² of usable area.				
Białystok	7.40	7.40	7.67	8.32
Bydgoszcz	7.77	7.90	8.05	8.37
Częstochowa	7.62	7.85	8.05	8.37
Gdańsk	7.77	7.90	8.05	8.37
Gdynia	7.77	7.90	8.05	8.37
Katowice	7.71	7.71	8.03	8.35
Kraków	7.77	7.77	8.03	8.37
Lublin	7.77	7.77	7.91	7.91
Łódź	7.77	7.90	8.05	8.37
Poznań	7.77	7.90	8.05	8.37
Radom	7.73	7.73	7.73	7.73
Szczecin	7.77	7.77	8.05	8.37
Warszawa	7.77	7.90	8.05	8.37
Wrocław	7.62	7.90	8.04	8.37
5.1. Non-business outbuildings per 1m ² of floor space				
Bydgoszcz	7.77	7.90	8.05	8.37
5.2. Non-business garages per 1m ² of floor space				
Bydgoszcz	7.77	7.90	8.05	8.37

cont. Table 2

6. Buildings – a percentage of their value as defined pursuant to Article 4(1)(3) and (3) to (7) of the Act of 12 January 1991 on Local Taxes and Fees.				
Białystok	2	2	2	2
Bydgoszcz	2	2	2	2
Częstochowa	2	2	2	2
Gdańsk	2	2	2	2
Gdynia	2	2	2	2
Katowice	2	2	2	2
Kraków	2	2	2	2
Lublin	2	2	2	2
Łódź	2	2	2	2
Poznań	2	2	2	2
Radom	2	2	2	2
Szczecin	2	2	2	2
Warszawa	2	2	2	2
Wrocław	2	2	2	2
7. Buildings or parts thereof associated with the conduct of business activities – the operation of zoos and constituting sports stadiums together with the infrastructure, which constitutes an integral technical and functional whole percentage of their value determined pursuant to Article 4(1)(3) and (3) to (7) of the Act of 12 January 1991 on Local Taxes and Fees. On land marked in the land and building register with the symbol “dr”, providing access to residential buildings				
Białystok	0.10	0.10	0.10	0.10
Kraków	0.10	0.10	0.10	0.10
Wrocław	0.10	0.10	0.10	0.10

Source: own elaboration based on local law acts published in the Podatek od nieruchomości będących własnością lub współwłasnością osób prawnych, PIB Urzędu Miejskiego w Białymstoku, https://www.bip.bialystok.pl/urzed_miejski/poradnik_interesanta/jak_zalawic_sprawę_wyszukiwarka_uslug/podatek-od-nieruchomosci-bedacych-wlasnoscia-lub-wspolwlasnoscia-osob-prawnych.html; Uchwały w sprawie stawek, PIB Urzędu Miasta Bydgoszczy, <https://bip.um.bydgoszcz.pl/artukul/1247/570/uchwaly-w-sprawie-stawek>; Stawki podatków i opłat, BIP Urzędu Miasta Częstochowy, <https://bip.czestochowa.pl/artykuly/71696/stawki-podatkow-i-oplat>; PIB Gminy Miasta Gdańsk, <https://bip.gdansk.pl/prawo-lokalne/podatki-i-oplaty-lokalne>; Uchwała nr XXIII/741/20 Rady Miasta Gdyni z dnia 28 października 2020 r. w sprawie określenia wysokości stawek podatku od nieruchomości na terenie Miasta Gdyni, <https://bip.um.gdynia.pl/podatki-i-oplaty-lokalne-w-2021-roku,8486/podatek-od-nieruchomosci-w-2021-roku,559076>; Podatek od nieruchomości w 2020 roku, PIB Urzędu Miasta Gdyni, <https://bip.um.gdynia.pl/podatki-i-oplaty-lokalne-w-2020-roku,8220/podatek-od-nieruchomosci-w-2020roku,545384>; Podatek od nieruchomości w 2019 roku, PIB Urzędu Miasta Gdyni, <https://bip.um.gdynia.pl/podatki-i-oplaty-lokalne-w-2019-roku,7977/podatek-od-nieruchomosci-w-2019-roku,532054>; Podatek od nieruchomości w 2018 roku, PIB Urzędu Miasta Gdyni, <https://bip.um.gdynia.pl/podatki-i-oplaty-loklane-w-2018-roku,7472/podatek-od-nieruchomosci-od-osob-fizycznych-w-2018-roku,516050>; Podatek od nieruchomości – osoby prawne / deklaracja na podatek od nieruchomości, PIB Urząd Miasta Katowice, <https://bip.katowice.eu/UrzedMiasta/KatalogUslug/KatalogUslug.aspx?idu=206>; Podatek od nieruchomości 2018 r., PIB Miasto Kraków, https://www.bip.krakow.pl/?dok_id=92389; Podatek od nieruchomości 2019, PIB Miasto Kraków, https://www.bip.krakow.pl/?dok_id=104370; Stawki podatku od nieruchomości na rok 2020, Krakowski Portal Podatnika, <https://kpp.um.krakow.pl/web/portal-podatnika/nieruchomosci>

stawki; Stawki podatku od nieruchomości na rok 2021, Krakowski Portal Podatnika, <https://kpp.um.krakow.pl/web/portal-podatnika/podatek-od-nieruchomosci-rolny-i-le-2021>; Podatek od nieruchomości, PIB Lublin, <https://bip.lublin.eu/finanse-i-majatek/podatki-i-oplaty/podatek-od-nieruchomosci/podatek-od-nieruchomosci,2,23496,2.html>; Uchwała nr LX/1588/17 Rady Miejskiej W Łodzi z dnia 15 listopada 2017 r. w sprawie określenia wysokości stawek podatku od nieruchomości, http://dziennik.lodzkie.eu/WDU_E/2017/4885/oryginal/akt.pdf; Uchwała nr I/27/18 Rady Miejskiej w Łodzi z dnia 28 listopada 2018 r. w sprawie określenia wysokości stawek podatku od nieruchomości, <http://dziennik.lodzkie.eu/legalact/2018/6579/>; Uchwała nr XV/640/19 Rady Miejskiej w Łodzi z dnia 16 października 2019 r. w sprawie określenia wysokości stawek podatku od nieruchomości, <http://dziennik.lodzkie.eu/legalact/2019/5884/>; Uchwała nr XXXI/1028/20 Rady Miejskiej w Łodzi z dnia 14 października 2020 r. w sprawie określenia wysokości stawek podatku od nieruchomości, https://bip.uml.lodz.pl/files/bip/public/BRM_2020/08_1028.pdf; Uchwała Nr LV/1011/VII/2017 Rady Miasta Poznania z dnia 17-10-2017 w sprawie określenia wysokości stawek podatku od nieruchomości na 2018 rok, <https://bip.poznan.pl/bip/uchwaly/uchwala-nr-lv-1011-vii-2017-z-dnia-2017-10-17,71167/>; Uchwała Nr LXXIV/1403/VII/2018 Rady Miasta Poznania z dnia 16-10-2018 w sprawie określenia wysokości stawek podatku od nieruchomości na 2019 rok, <https://bip.poznan.pl/bip/uchwaly/uchwala-nr-lxxiv-1403-vii-2018-z-dnia-2018-10-16,77067/>; Uchwała Nr XVIII/300/VIII/2019 Rady Miasta Poznania z dnia 15-10-2019 w sprawie określenia wysokości stawek podatku od nieruchomości na 2020 rok, <https://bip.poznan.pl/bip/uchwaly/uchwala-nr-xviii-300-viii-2019-z-dnia-2019-10-15,80063/>; Uchwała Nr XXXVI/639/VIII/2020 Rady Miasta Poznania z dnia 13-10-2020 w sprawie określenia wysokości stawek podatku od nieruchomości na 2021 rok, <https://bip.poznan.pl/bip/uchwaly/uchwala-nr-xxxvi-639-viii-2020-z-dnia-2020-10-13,82737/>; Podatek od nieruchomości (możliwość ONLINE), PIB Urząd Miejski w Radomiu, <https://bip.radom.pl/ra/finanse-podatki-lokalne/podatki-lokalne/13124.Podatek-od-nieruchomosci-mozliwosc-ONLINE.html>; Uchwała nr XXXIV/938/17 Rady Miasta Szczecin z dnia 17 października 2017 r. w sprawie stawek podatku od nieruchomości, https://przyjazne-deklaracje.pl/resources/dokumenty/szczecin/podatek-od-nieruchomosci/2019/Szczecin-Podatek_od_nieruchomosci-DN-1-Uchwala-17_10_2017.pdf; Podatek od nieruchomości miasto Szczecin, <https://przyjazne-deklaracje.pl/witryna/podatek-od-nieruchomosci?siteCode=d4b750ef-aeca-4d35-a20b-106408a2d6b6>; Uchwała nr LVI/1393/2017 Rady Miasta Stołecznego Warszawy z dnia 19 października 2017 r. w sprawie określenia wysokości stawek podatku od nieruchomości na 2018 rok, http://edziennik.mazowieckie.pl/WDU_W/2017/9653/akt.pdf; Uchwała nr LXXIV/2104/2018 Rady Miasta Stołecznego Warszawy z dnia 27 września 2018 r. w sprawie określenia wysokości stawek podatku od nieruchomości na 2019 rok http://edziennik.mazowieckie.pl/WDU_W/2018/9420/akt.pdf; Uchwała nr XXI/537/2019 Rady Miasta Stołecznego Warszawy z dnia 7 listopada 2019 r. w sprawie określenia wysokości stawek podatku od nieruchomości na 2020 r., <https://edziennik.mazowieckie.pl/legalact/2019/13137/>; Uchwała nr XXXIX/1211/2020 Rady Miasta Stołecznego Warszawy z dnia 19 listopada 2020 r. w sprawie określenia wysokości stawek podatku od nieruchomości na 2021 rok https://edziennik.mazowieckie.pl/WDU_W/2020/11547/akt.pdf; Uchwała nr II/7/18 Rady Miejskiej Wrocławia z dnia 22 listopada 2018 r. w sprawie wysokości stawek podatku od nieruchomości, <https://baw.um.wroc.pl/UrządMiastaWroclawia/document/37242/Uchwa%C5%82a-II-7-18>; Uchwała nr LI/8/18 Rady Miejskiej Wrocławia z dnia 22 listopada 2018 r. w sprawie wzorów formularzy informacji oraz deklaracji na podatek od nieruchomości, podatek rolny i podatek leśny oraz ich formatu elektronicznego, warunków i trybu składania za pomocą środków komunikacji elektronicznej, https://edzienniki.duw.pl/WDU_D/2018/6001/akt.pdf; Uchwała nr XV/415/19 Rady Miejskiej Wrocławia z dnia 21 listopada 2019 r. w sprawie wysokości stawek podatku od nieruchomości, https://edzienniki.duw.pl/WDU_D/2019/6974/akt.pdf; Uchwała nr XXXI/790/20 Rady Miejskiej Wrocławia z dnia 20 listopada 2020 r. w sprawie wysokości stawek podatku od nieruchomości https://edzienniki.duw.pl/WDU_D/2020/6531/akt.pdf (access: 30.08.2022).

The juxtaposition of property tax rates in Table 2 shows considerable variation in the amount of tax in the surveyed cities. More than half of the surveyed cities in 2018-2019 set tax rates at the maximum permitted level (with reference to the data in Table 1). The remaining cities set them at lower levels than the maximum rate in force for the year. Radom was the only city that kept rates at a low level for the examined four-year period.

Table 3. Share of property tax revenue in the general revenue of the analyzed cities from 2018 to 2021, together with the dynamics of tax revenue in percentages

The city of	Total property tax revenue (receipts) for the years 2018-2021 in PLN as of 31 December of the given year				Share of property tax in total budget revenue 2018-2021 in % (2018 = 100%)				Dynamics of property tax revenue from 2018 to 2021 year-on-year in %		
	2018	2019	2020	2021	2018	2019	2020	2021	2019/2018	2020/2019	2021/2020
Białystok	160,429,964	162,121,851	168,586,230	179,586,752	7.79	7.47	7.53	7.57	101.05	103.99	106.53
Bydgoszcz	232,856,215	238,618,334	242,637,634	259,055,628	11.04	10.06	10.19	10.18	102.47	101.68	106.77
Częstochowa	144,375,750	142,873,375	149,783,471	168,440,198	11.42	10.31	10.11	10.34	98.96	104.84	112.46
Gdańsk	432,760,073	506,400,870	488,851,564	530,426,189	13.21	13.98	12.44	12.32	117.02	96.53	108.50
Gdynia	162,173,111	155,257,031	156,839,539	169,699,288	10.10	8.61	8.36	8.36	95.74	101.02	108.20
Katowice	236,643,371	244,272,028	248,591,875	276,007,591	12.08	11.19	10.42	10.83	103.22	101.77	111.03
Kraków	531,492,976	544,594,476	555,491,821	602,973,537	10.01	9.21	8.96	8.39	102.47	102.00	108.55
Lublin	207,249,945	212,308,069	221,632,418	229,211,263	9.24	9.00	9.24	8.29	102.44	104.39	103.42
Łódź	432,854,215	451,065,917	461,074,242	499,946,534	10.62	10.01	9.36	9.34	104.21	102.22	108.43
Poznań	419,709,950	436,695,196	453,034,754	482,324,346	11.35	10.49	10.39	9.67	104.05	103.74	106.47
Radom	106,458,913	113,872,467	113,440,183	116,571,520	8.85	8.33	7.75	7.86	106.96	99.62	102.76
Szczecin	249,723,123	247,408,891	263,783,569	279,051,703	10.91	9.38	8.61	8.60	99.07	106.62	105.79
Warszawa	1,232,827,563	1,265,197,512	1,188,766,055	1,362,643,062	7.23	6.99	6.41	6.31	102.63	93.96	114.63
Wrocław	449,193,698	469,905,918	463,962,204	499,204,329	10.08	9.53	8.96	8.06	104.61	98.74	107.60

Source: own compilation based on the city budget execution reports for Sprawozdanie z wykonania budżetu za 2018 r., PIB Urzędu Miejskiego w Białymstoku, https://bip.bialystok.pl/finanse/budzet_miasta/budzet2018/sprawozdanie-z-wykonania-budzetu-za-2018-r.html; Sprawozdanie z wykonania budżetu za 2019 r., PIB Urzędu Miejskiego w Białymstoku, https://bip.bialystok.pl/finanse/budzet_miasta/budzet2019/sprawozdanie-z-wykonania-budzetu-za-2019-r.html; Sprawozdanie z wykonania budżetu za 2020 r., PIB Urzędu Miejskiego w Białymstoku, https://bip.bialystok.pl/finanse/budzet_miasta/budzet_2020/sprawozdanie-z-wykonania-budzetu-za-2020-r.html; Sprawozdanie z wykonania budżetu za 2021 r., PIB Urzędu Miejskiego w Białymstoku, https://bip.bialystok.pl/finanse/budzet_miasta/budzet_2021/sprawozdanie-z-wykonania-budzetu-za-2021-r.html; Wykonanie Budżetu za 2018 rok, PIB miasta Bydgoszcz, https://archiwumbip.um.bydgoszcz.pl/finanse/budzet_miasta_bydgoszcz/Wykonanie_Bud_etu_Miasta_za_2018_rok/index.htm; Wykonanie Budżetu za 2019 rok, PIB miasta Bydgoszcz https://archiwumbip.um.bydgoszcz.pl/finanse/budzet_miasta_bydgoszcz/Wykonanie_Bud_etu_Miasta_za_2019_rok/index.htm; Wykonanie Budżetu za 2020 rok, PIB miasta Bydgoszcz https://archiwumbip.um.bydgoszcz.pl/finanse/budzet_miasta_bydgoszcz/Wykonanie_Bud_etu_Miasta_za_2020_rok/index.htm; Wykonanie Budżetu za 2021 rok, PIB miasta Bydgoszcz <https://bip.um.bydgoszcz.pl/artyku/916/671/wykonanie-budzetu-miasta>

bydgoszczy-za-2021-rok; Sprawozdania z wykonania budżetu, PIB Urzędu miasta Częstochowy, <https://bip.czestochowa.pl/artykuly/33091/sprawozdania-z-wykonania-budzetu>; Sprawozdanie z wykonania budżetu miasta Gdańska za 2021 rok, PIB Gmina miasta Gdańska, <https://bip.gdansk.pl/urzad-miejski/Sprawozdanie-z-wykonania-budzetu-Miasta-Gdanska-za-2021-rok.a.217054>; Sprawozdanie z wykonania budżetu miasta Gdańska za 2020 rok, PIB Gmina miasta Gdańska, <https://bip.gdansk.pl/urzad-miejski/Sprawozdanie-z-wykonania-budzetu-Miasta-Gdanska-za-2020-rok.a.192812>; Sprawozdanie z wykonania budżetu miasta Gdańska za 2019 rok, PIB Gmina miasta Gdańska, <https://bip.gdansk.pl/urzad-miejski/Sprawozdanie-z-wykonania-budzetu-Miasta-Gdanska-za-2019-rok.a.167822>; Sprawozdanie z wykonania budżetu miasta Gdańska za 2018 rok, PIB Gmina miasta Gdańska, <https://bip.gdansk.pl/urzad-miejski/Sprawozdanie-z-wykonania-budzetu-Miasta-Gdanska-za-2018-rok.a.142390>; Sprawozdanie z wykonania budżetu miasta Gdyni za 2018 rok, PIB Urzędu miasta Gdyni, <https://bip.um.gdynia.pl/2018-2.7389/sprawozdanie-z-wykonania-budzetu-miasta-gdyni-za-2018-rok.535901>; Sprawozdanie z wykonania budżetu miasta Gdyni za 2019 rok, PIB Urzędu miasta Gdyni, <https://bip.um.gdynia.pl/2019.7972/sprawozdanie-z-wykonania-budzetu-miasta-gdyni-za-2019-rok.548196>; Sprawozdanie z wykonania budżetu miasta Gdyni za 2020 rok, Informacja o stanie mienia komunalnego miasta Gdyni za 2020 rok, PIB Urzędu miasta Gdyni, <https://bip.um.gdynia.pl/2020.8206/sprawozdanie-z-wykonania-budzetu-miasta-gdyni-za-2020-rok-informacja-o-stanie-mienia-komunalnego-za-2020-rok.561581>; Sprawozdanie z wykonania budżetu miasta Gdyni za 2021 rok, PIB Urzędu miasta Gdyni, <https://bip.um.gdynia.pl/2021.8471/sprawozdanie-finansowe-urzedu-miasta-gdyni-za-2021-rok.573688>; Budżet miasta i jego zmiany, PIB Urząd miasta Katowice, <https://bip.katowice.eu/Finanse/dokument.aspx?idr=89238&menu=566>; Sprawozdanie z wykonania Budżetu miasta Krakowa za 2018 rok, PIB miasto Kraków, https://www.bip.krakow.pl/?sub_dok_id=107706; Sprawozdanie z wykonania Budżetu miasta Krakowa za 2019 rok, PIB miasto Kraków, https://www.bip.krakow.pl/?sub_dok_id=123891; Sprawozdanie z wykonania Budżetu miasta Krakowa za 2020 rok, PIB miasto Kraków, https://www.bip.krakow.pl/?sub_dok_id=139477; Sprawozdanie z wykonania Budżetu miasta Krakowa za 2021 rok, PIB miasto Kraków, https://www.bip.krakow.pl/?sub_dok_id=151360; Sprawozdanie z wykonania budżetu miasta, PIB Lublin, <https://bip.lublin.eu/finanse-i-majatek/sprawozdanie-z-wykonania-budzetu-miasta/>; Projekty uchwał: w sprawie budżetu miasta Łodzi na 2023 rok oraz w sprawie Wieloletniej Prognozy Finansowej miasta Łodzi na lata 2023–2050, <https://bip.um.lodz.pl/miasto/budzet-miasta/>; Opisowe sprawozdanie z wykonania budżetu miasta Poznania za 2018 rok, PIB miasta Poznania, <https://bip.poznan.pl/bip/rok-2018.doc.1222.3721/opisowe-sprawozdanie-z-wykonania-budzetu-miasta-poznania-za-2018-rok.93747.html>; Opisowe sprawozdanie z wykonania budżetu miasta Poznania za 2019 rok, PIB miasta Poznania, <https://bip.poznan.pl/bip/rok-2019.doc.1222.3861/opisowe-sprawozdanie-z-wykonania-budzetu-miasta-poznania-za-2019-rok.100423.html>; Opisowe sprawozdanie z wykonania budżetu miasta Poznania za 2020 rok, PIB miasta Poznania, <https://bip.poznan.pl/bip/rok-2020.doc.1222.4021/opisowe-sprawozdanie-z-wykonania-budzetu-miasta-poznania-za-2020-rok.106590.html>; Opisowe sprawozdanie z wykonania budżetu miasta Poznania za 2021 rok, PIB miasta Poznania, <https://bip.poznan.pl/bip/rok-2021.doc.1222.4101/opisowe-sprawozdanie-z-wykonania-budzetu-miasta-poznania-za-2021-rok.113794.html>; Zarządzenie nr 387/2019 Prezydenta miasta Radomia z dnia 28 marca 2019 r. w sprawie przedłożenia sprawozdania rocznego z wykonania budżetu Gminy miasta Radomia za 2018 rok wraz z informacją o stanie mienia komunalnego, <https://bip.radom.pl/download/69/76024/Sprawozdaniezwykoniabudzetuza2018rok.pdf>; Zarządzenie nr 1375/2020 Prezydenta miasta Radomia z dnia 27 marca 2020 r. w sprawie przedłożenia sprawozdania rocznego z wykonania budżetu Gminy miasta Radomia za 2019 rok wraz z informacją o stanie mienia komunalnego, <https://bip.radom.pl/download/69/84444/1375.pdf>; Zarządzenie nr 2347/2021 Prezydenta miasta Radomia z dnia 31 marca 2021 r. w sprawie przedłożenia sprawozdania rocznego z wykonania budżetu Gminy miasta Radomia za 2020 rok, <https://bip.radom.pl/ra/wladze-miasta/zarzadzenia-prezydenta/52975.Nr-23472021-w-sprawie-przedlozenia-sprawozdania-rocznego-z-wykonania-budzetu-Gmi.html>; Zarządzenie nr 3482/2022 Prezydenta miasta Radomia z dnia 28 kwietnia 2022r. w sprawie przedłożenia sprawozdania rocznego z wykonania budżetu Gminy miasta Radomia za 2021 rok, <https://bip.radom.pl/ra/finanse-podatki-lokalne/budzet/wykonanie/57894.ZA-RZADZENIE-NR-34822022-PREZYDENTA-MIASTA-RADOMIA-z-dnia-28-kwietnia-2022r-w-spr.html>; Budżet miasta, PIB miasta Szczecin, https://bip.um.szczecin.pl/chapter_11073.asp; Wykonanie budżetu m.st. Warszawy, PIB m.st. Warszawy, https://bip.warszawa.pl/Menu_przedmiotowe/budzet_polityka_finansowa_v2/wykonanie_budzetu/default.htm; Sprawozdanie z wykonania budżetu miasta za 2018 rok, PIB Urzędu Miejskiego Wrocławia, <https://bip.um.wroc.pl/artykul/808/37963/sprawozdanie-z-wykonania-budzetu-miasta-za-2018-rok>; Sprawozdanie z wykonania budżetu miasta za 2020 rok, PIB Urzędu Miejskiego Wrocławia, <https://bip.um.wroc.pl/artykuly/978/sprawozdanie-z-wykonania-budzetu-za-rok-2020>; Sprawozdanie z wykonania budżetu miasta za 2020 rok, PIB Urzędu Miejskiego Wrocławia, <https://bip.um.wroc.pl/artykul/1041/60161/sprawozdanie-z-wykonania-budzetu-za-rok-2021>.

The Radom authorities probably tried to compete with other cities for new investments through low property tax rates. During the COVID-19 pandemic, especially in 2021, most surveyed cities kept tax rates at the maximum allowable level. In addition, cities did not implement a general system of taxpayer relief during the COVID-19 pandemic for businesses. This situation was due to problems in raising revenue for the budgets of the individual cities, and they, therefore, tried to keep property tax revenue as high as possible.

An analysis of the individual property tax rates in Table 2 shows that the highest rates were for the taxation of building space used for business activities. This means that cities derive the highest revenue to the budget from property tax from businesses. City authorities can compete with other cities to attract new residents or businesses through property tax rates. Unfortunately, as the data in Table 2 indicate, few cities set tax rates at a lower level than the maximum set by the Minister of Finance. For example, in 2021, out of 14 cities, three cities (Białystok – PLN 24.40, Lublin – PLN 23.18, Radom – PLN 21.90) introduced lower than the maximum property tax rates for enterprises. The remaining cities have set tax rates at the maximum level of PLN 24.84 despite the COVID-19 pandemic. Such a tax rate policy means that city authorities recognize property tax as an important local tax affecting budget revenues.

However, a review of the tax rates shows some examples of implementing a reduced rate system for selected business entities by city authorities. An example of such cities is Krakow, which has established lower tax rates for selected sectors of business entities. Lower property tax rates for companies have also been established in Gdańsk.

In addition, of the 14 cities analyzed, three cities (Białystok, Kraków, Wrocław) set a lower percentage property tax rate for selected economic activities (at 0.10% instead of the 2% tax rate). Setting lower property tax rates by city authorities makes it possible to support selected economic entities. A comparison of tax rates shows that the authorities of selected cities (Białystok, Kraków, Wrocław) supported economic entities from industries unique to the city and sports clubs. In addition, the city of Kraków reduced property tax rates for the form of zoological garden operator.

The authorities of most of the cities surveyed set property tax rates for individuals at maximum levels. It is worth noting that the tax rate for individuals is much lower than for businesses.

Table 3 shows the overall share of property tax revenue in the total revenue of the 14 surveyed cities from 2018 to 2021. In addition, Table 3 also contains data on the dynamics of property tax revenue on an annual basis. According to the data in Table 3, the highest share of real estate tax in total budget revenues concerned the city of Gdańsk (maximum 13.98% in 2019 and minimum 12.32% in 2021). The revenue from property tax in Gdańsk was at the highest level of all the cities examined throughout the period under study. The next city with the highest share of property tax in total income was Katowice (12.08% share in total income in 2018). Katowice's share of income from the analyzed tax was also above 10% in subsequent years. Among the cities under study, in the period 2018-2021, two more cities – Bydgoszcz and Częstochowa – recorded a share of property tax in total income at a level above 10% in a given year. Generalizing, it should be stated that in total, in four cities (Gdańsk, Katowice, Bydgoszcz, Częstochowa) out of the examined 14 cities, the share of property tax exceeded 10% of the share in total revenues to the budget.

The lowest share of property tax in total budget revenue for the period 2018-2021 was found in Warsaw in 2021 (6.31%). Also, in the remaining years, revenue from property tax in Warsaw represented the lowest percentage share of all 14 cities analyzed. This may indicate that, despite the dynamic development of the capital city of Warsaw, the analyzed

property tax is not as important a source of income for the city as it is in the case of the other cities. The analysis showed that in the case of six cities in total (Krakow, Łódź, Poznań, Szczecin, Warsaw and Wrocław), the share of property tax in total city budget revenues showed a constant downward trend. This trend indicates a decreasing share of property tax in the revenues to the budget of the largest cities in Poland. In addition, it may also indicate a change in the structure of the overall share of the analyzed real estate tax in revenues to the budgets of the analyzed cities. By averaging the level of the share of the analyzed real estate tax in particular years for all 14 examined cities, it can be concluded that it was at the level of 9%.

The highest annual growth rate of income from property tax in revenues to the city budget was established in Gdańsk in 2019 (17.02% compared to the income in 2018). The highest decrease in tax revenue on an annual basis was in Warsaw in 2020 compared to 2019 (6.04% decrease). The annual increase in property tax revenue concerned a total of seven cities (Białystok, Bydgoszcz, Katowice, Kraków, Lublin, Łódź, Poznań). Therefore, it should be recognized that during the period under study, half of the cities studied recorded at least a one-off decrease in property tax revenue on an annual basis. The analysis also showed that there was no case of a city that recorded a permanent decline in property tax revenue on an annual basis. The identified revenue declines in the surveyed cities were only for one-year cases. A decrease in property tax revenue in a given year may cause problems in the financial stability of the analyzed cities' budgets. In addition, a change in the consumer price index in a given year at a high level, accompanied by a decrease in property tax revenue, may lead to financial problems for a given city.

Generalizing, it should be noted that there is variation between the surveyed cities in the share of property tax revenue in total revenue. The perceived differences in the level of property tax revenue between cities are, to a large extent, due to the large differences in the rates of the tax analyzed.

Conclusions

Property tax continues to be one of the most important local taxes collected by local governments in Poland. The municipal council sets the real estate tax rate for a given tax subject within the maximum rates set by the Minister of Finance.

The authorities of individual cities set tax rates separately for each subject of the real estate tax. A review of the property tax rates of the 14 largest cities in Poland revealed a diversity in the applicable tax rates. Most cities set the property tax rate at the maximum possible level. Few cities set rates at a low level and maintained them for the four years under review. The lowest fixed level of real estate tax rates concerned Radom. City authorities try to attract new investments and residents through property tax rates. The highest level of property tax rates concerned economic entities. Few cities reduced the property tax rate for selected sectors of the economy (Kraków, Gdańsk, Białystok, Wrocław).

The share of real estate tax in the overall budget revenues of individual cities is quite diverse. During the period under review, it ranged from 6.31% (Warsaw in 2021) to a maximum of 13.98% (Gdańsk in 2019). In total, in four cities (Gdańsk, Katowice, Bydgoszcz, Częstochowa), the share of the real estate tax exceeded 10% of the share in total budget revenues. Averaging the results of the share of the real estate tax in total budget revenues in individual years, it should be noted that it amounted to approximately 9%. An annual increase in revenue from the analyzed tax concerned half of the examined cities. The analysis of property tax rates allows us to conclude that the amount of revenue to the budget was influenced by the tax rate. The highest property tax revenues are collected

from enterprises due to the level of tax rates collected, and few cities set tax rates at a lower level for businesses.

The period studied covered two years of the COVID-19 pandemic, which is noteworthy.²⁰ The analysis showed that in the first year of the COVID-19 pandemic (in 2020), the decrease in revenue from property tax compared to 2019 affected a total of four cities. In contrast, in the following year (2021), all of the assessed Polish cities experienced an increase in revenue from this tax. The increase in property tax revenue in 2021 was due to most cities setting property tax rates at the maximum allowable level. In addition, the cities analyzed during the COVID-19 pandemic did not apply the property tax exemption system. The authorities of the cities considered that, with decreasing income to the budget, it was necessary to raise funds from property tax at the highest possible level.

The analysis carried out made it possible to positively verify the hypothesis that the level of property tax rates influences the level of income to the city budget. To generalize, it should be stated that the property tax is an important source of income for cities. Property tax rate policies contribute to the amount of property tax revenue, and low property tax rates can contribute to attracting new investment or residents. In addition, an assessment of the level of its contribution to total budget revenue can indirectly indicate the increase or decrease in the number of properties within the city. The growth of new properties within the city area should potentially increase the revenue from this tax. In addition, data on the increase or decrease in revenue from property tax may also indicate the city's development level and the increase in the wealth of its inhabitants.

References

- Budżet miasta, PIB miasta Szczecin, https://bip.um.szczecin.pl/chapter_11073.asp (access: 30.08.2022).
- Collier P., Glaeser E., Venables T., Blake M., Manwaring P.: Land and property taxes for municipal finance, The International Growth Centre, 2018, <https://www.theigc.org/wp-content/uploads/2017/08/Land-and-Property-Taxes-for-Municipal-Finance-06.07.18.pdf> (access: 18.10.2022).
- Etel L.: Reforma opodatkowania nieruchomości w Polsce, Temida 2, Białystok 1998.
- Farvacque-Vitkovic C., Kopanyi M.: Municipal Finances. A Handbook for Local Governments, International Bank for Reconstruction and Development, The World Bank, Washington DC 2014.
- Felis P., Rosłaniec H., Wykorzystanie podatku od nieruchomości w lokalnej polityce podatkowej miast Unii Metropolii Polskich, *Gospodarka Narodowa*, 2/2017, p. 45-67.
- Goraj L., Mańko S.: Rachunkowość i analiza ekonomiczna w indywidualnym gospodarstwie rolnym, Difin, Warszawa 2009.
- Gruber J.: Public Finance and Public Policy, fifth edition, Worth Publishers, New York 2016.
- Koślicki K.: Opodatkowanie budowli podatkiem od nieruchomości, Wolters Kluwer Polska, Warszawa 2022.

²⁰ Raport finansów samorządów terytorialnych po pandemii. Od kryzysu do rozwoju, https://www.senat.gov.pl/gfx/senat/userfiles/_public/k10/senat/zespoly/samorzadz/raport_finanse-samorzadow-po-pandemii_forp_fpk_2021_11_25-1.pdf (access: 03.09.2022).

Obwieszczenie Ministra Finansów z dnia 23 lipca 2020 r. w sprawie górnych granic stawek kwotowych podatków i opłat lokalnych na rok 2021, M.P. z 2020, poz. 673.

Obwieszczenie Ministra Finansów z dnia 24 lipca 2019 r. w sprawie górnych granic stawek kwotowych podatków i opłat lokalnych na rok 2020, M.P. z 2019 r., poz. 738.

Obwieszczenie Ministra Finansów z dnia 25 lipca 2018 r. w sprawie górnych granic stawek kwotowych podatków i opłat lokalnych na rok 2019, M.P. z 2018, poz. 745.

Obwieszczenie Ministra Rozwoju i Finansów z dnia 28 lipca 2017 r. w sprawie górnych granic stawek kwotowych podatków i opłat lokalnych w 2018 r., M.P. z 2017, poz. 800.

Opisowe sprawozdanie z wykonania budżetu miasta Poznania za 2018 rok, PIB miasta Poznania, <https://bip.poznan.pl/bip/rok-2018,doc,1222,3721/opisowe-sprawozdanie-z-wykonania-budzetu-miasta-poznania-za-2018-rok,93747.html> (access: 30.08.2022).

Opisowe sprawozdanie z wykonania budżetu miasta Poznania za 2019 rok, PIB miasta Poznania, <https://bip.poznan.pl/bip/rok-2019,doc,1222,3861/opisowe-sprawozdanie-z-wykonania-budzetu-miasta-poznania-za-2019-rok,100423.html> (access: 30.08.2022).

Opisowe sprawozdanie z wykonania budżetu miasta Poznania za 2020 rok, PIB miasta Poznania, <https://bip.poznan.pl/bip/rok-2020,doc,1222,4021/opisowe-sprawozdanie-z-wykonania-budzetu-miasta-poznania-za-2020-rok,106590.html> (access: 30.08.2022).

Opisowe sprawozdanie z wykonania budżetu miasta Poznania za 2021 rok, PIB miasta Poznania, <https://bip.poznan.pl/bip/rok-2021,doc,1222,4101/opisowe-sprawozdanie-z-wykonania-budzetu-miasta-poznania-za-2021-rok,113794.html> (access: 30.08.2022).

PIB Gminy Miasta Gdańsk, <https://bip.gdansk.pl/prawo-lokalne/podatki-i-oplaty-lokalne> (access: 30.08.2022).

Podatek od nieruchomości – osoby prawne / deklaracja na podatek od nieruchomości, PIB Urząd Miasta Katowice, <https://bip.katowice.eu/UrządMiasta/KatalogUslug/KatalogUslug.aspx?idu=206> (access: 30.08.2022).

Podatek od nieruchomości (możliwość ONLINE), PIB Urząd Miejski w Radomiu, <https://bip.radom.pl/ra/finanse-podatki-lokalne/podatki-lokalne/13124,Podatek-od-nieruchomosci-mozliwosc-ONLINE.html> (access: 30.08.2022).

Podatek od nieruchomości 2018 r., PIB Miasto Kraków, https://www.bip.krakow.pl/?dok_id=92389 (access: 30.08.2022).;

Podatek od nieruchomości 2019, PIB Miasto Kraków, https://www.bip.krakow.pl/?dok_id=104370 (access: 30.08.2022).

Podatek od nieruchomości będących własnością lub współwłasnością osób prawnych, PIB Urzędu Miejskiego w Białymstoku, https://www.bip.bialystok.pl/urząd_miejski/poradnik_interesanta/jak_zalotwic_sprawe_wyszukiwarka_uslug/podatek-od-nieruchomosci-bedacych-wlasnoscia-lub-wspolwlasnoscia-osob-prawnych.html (access: 30.08.2022).

Podatek od nieruchomości miasto Szczecin, <https://przyjazne-deklaracje.pl/witryna/podatek-od-nieruchomosci?siteCode=d4b750ef-aeca-4d35-a20b-106408a2d6b6> (access: 30.08.2022).

Podatek od nieruchomości w 2018 roku, PIB Urzędu Miasta Gdyni, <https://bip.um.gdynia.pl/podatki-i-oplaty-loklane-w-2018-roku,7472/podatek-od-nieruchomosci-od-osob-fizycznych-w-2018-roku,516050> (access: 30.08.2022).

Podatek od nieruchomości w 2019 roku, PIB Urzędu Miasta Gdyni, <https://bip.um.gdynia.pl/podatki-i-oplaty-lokalne-w-2019-roku,7977/podatek-od-nieruchomosci-w-2019-roku,532054> (access: 30.08.2022).

- Podatek od nieruchomości w 2020 roku, PIB Urzędu Miasta Gdyni, <https://bip.um.gdynia.pl/podatki-i-oplaty-lokalne-w-2020-roku,8220/podatek-od-nieruchomosci-w-2020roku,545384> (access: 30.08.2022).
- Podatek od nieruchomości, PIB Lublin, <https://bip.lublin.eu/finanse-i-majatek/podatki-i-oplaty/podatek-od-nieruchomosci/podatek-od-nieruchomosci,2,23496,2.html> (access: 30.08.2022).
- Podstawka M. (ed.): *Finanse Instytucje Instrumenty Podmioty Rynki Regulacje*, Wydawnictwo PWN, Warszawa 2010.
- Podstawka M.: *Podstawy finansów. Teoria i praktyka*, Wydawnictwo SGGW, Warszawa 2011.
- Projekty uchwał: w sprawie budżetu miasta Łodzi na 2023 rok oraz w sprawie Wieloletniej Prognozy Finansowej miasta Łodzi na lata 2023–2050, <https://bip.uml.lodz.pl/miasto/budzet-miasta/> (access: 30.08.2022).
- Raport finanse samorządów terytorialnych po pandemii. Od kryzysu do rozwoju, [https://www.senat.gov.pl/gfx/senat/userfiles/_public/k10/senat/zespoły/samorządów-po-pandemii_forp_fpk_2021_11_25-1.pdf](https://www.senat.gov.pl/gfx/senat/userfiles/_public/k10/senat/zespoły/samorząd/raport_finanse-samorządów-po-pandemii_forp_fpk_2021_11_25-1.pdf) (access: 03.09.2022).
- Slack E.: *The Property Tax – in Theory and Practice*, IMFG Paperson Municipal Finance and Governance, 2/2011, p. 2-4.
- Sprawozdanie z wykonania budżetu miasta Gdańska za 2018 rok, PIB Gmina miasta Gdańska, <https://bip.gdansk.pl/urząd-miejski/Sprawozdanie-z-wykonania-budżetu-Miasta-Gdanska-za-2018-rok,a,142390> (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu miasta Gdańska za 2019 rok, PIB Gmina miasta Gdańska, <https://bip.gdansk.pl/urząd-miejski/Sprawozdanie-z-wykonania-budżetu-Miasta-Gdanska-za-2019-rok,a,167822> (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu miasta Gdańska za 2020 rok, PIB Gmina miasta Gdańska, <https://bip.gdansk.pl/urząd-miejski/Sprawozdanie-z-wykonania-budżetu-Miasta-Gdanska-za-2020-rok,a,192812> (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu miasta Gdańska za 2021 rok, PIB Gmina miasta Gdańska, <https://bip.gdansk.pl/urząd-miejski/Sprawozdanie-z-wykonania-budżetu-Miasta-Gdanska-za-2021-rok,a,217054> (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu miasta Gdyni za 2018 rok, PIB Urzędu miasta Gdyni, <https://bip.um.gdynia.pl/2018-2,7389/sprawozdanie-z-wykonania-budżetu-miasta-gdyni-za-2018-rok,535901> (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu miasta Gdyni za 2019 rok, PIB Urzędu miasta Gdyni, <https://bip.um.gdynia.pl/2019,7972/sprawozdanie-z-wykonania-budżetu-miasta-gdyni-za-2019-rok,548196> (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu miasta Gdyni za 2020 rok. Informacja o stanie mienia komunalnego miasta Gdyni za 2020 rok, PIB Urzędu miasta Gdyni, <https://bip.um.gdynia.pl/2020,8206/sprawozdanie-z-wykonania-budżetu-miasta-gdyni-za-2020-rok-informacja-o-stanie-mienia-komunalnego-za-2020-rok,561581> (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu miasta Gdyni za 2021 rok, PIB Urzędu miasta Gdyni, <https://bip.um.gdynia.pl/2021,8471/sprawozdanie-finansowe-urzedu-miasta-gdyni-za-2021-rok,573688>(access: 30.08.2022). Budżet miasta i jego zmiany, PIB Urząd miasta Katowice, <https://bip.katowice.eu/Finanse/dokument.aspx?idr=89238&menu=566> (access: 30.08.2022).
- Sprawozdanie z wykonania Budżetu miasta Krakowa za 2018 rok, PIB miasto Kraków, https://www.bip.krakow.pl/?sub_dok_id=107706 (access: 30.08.2022).

- Sprawozdanie z wykonania Budżetu miasta Krakowa za 2019 rok, PIB miasto Kraków, https://www.bip.krakow.pl/?sub_dok_id=123891 (access: 30.08.2022).
- Sprawozdanie z wykonania Budżetu miasta Krakowa za 2020 rok, PIB miasto Kraków, https://www.bip.krakow.pl/?sub_dok_id=139477 (access: 30.08.2022).
- Sprawozdanie z wykonania Budżetu miasta Krakowa za 2021 rok, PIB miasto Kraków, https://www.bip.krakow.pl/?sub_dok_id=151360(access: 30.08.2022).
- Sprawozdanie z wykonania budżetu miasta za 2018 rok, PIB Urzędu Miejskiego Wrocławia, <https://bip.um.wroc.pl/arttykul/808/37963/sprawozdanie-z-wykonania-budzetu-miasta-za-2018-rok> (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu miasta za 2019 rok, PIB Urzędu Miejskiego Wrocławia, <https://bip.um.wroc.pl/arttykul/884/44433/sprawozdanie-z-wykonania-budzetu-miasta-za-2019-rok> (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu miasta za 2020 rok, PIB Urzędu Miejskiego Wrocławia, <https://bip.um.wroc.pl/arttykuly/978/sprawozdanie-z-wykonania-budzetu-za-rok-2020> (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu miasta za 2020 rok, PIB Urzędu Miejskiego Wrocławia, <https://bip.um.wroc.pl/arttykul/1041/60161/sprawozdanie-z-wykonania-budzetu-za-rok-2021> (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu miasta, PIB Lublin, <https://bip.lublin.eu/finanse-i-majatek/sprawozdanie-z-wykonania-budzetu-miasta/> (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu za 2018 r., PIB Urzędu Miejskiego w Białymstoku, https://bip.bialystok.pl/finanse/budzet_miasta/budzet2018/sprawozdanie-z-wykonania-budzetu-za-2018-r.html (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu za 2019 r., PIB Urzędu Miejskiego w Białymstoku, https://bip.bialystok.pl/finanse/budzet_miasta/budzet2019/sprawozdanie-z-wykonania-budzetu-za-2019-r.html (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu za 2020 r., PIB Urzędu Miejskiego w Białymstoku, https://bip.bialystok.pl/finanse/budzet_miasta/budzet_2020/sprawozdanie-z-wykonania-budzetu-za-2020-r.html (access: 30.08.2022).
- Sprawozdanie z wykonania budżetu za 2021 r., PIB Urzędu Miejskiego w Białymstoku, https://bip.bialystok.pl/finanse/budzet_miasta/budzet_2021/sprawozdanie-z-wykonania-budzetu-za-2021-r.html (access: 30.08.2022).
- Stawasz D.: Współczesne dylematy zarządzania rozwojem miast. Akademia samorządowa, Uniwersytet Łódzki, Łódź 2016.
- Stawasz D.: Współczesne miasta. Aktualne możliwości rozwoju. Akademia samorządowa, Uniwersytet Łódzki, Łódź 2020.
- Stawki podatków i opłat, BIP Urzędu Miasta Częstochowy, <https://bip.czestochowa.pl/arttykuly/71696/stawki-podatkow-i-oplat> (access: 30.08.2022).
- Stawki podatku od nieruchomości na rok 2020, Krakowski Portal Podatnika, <https://kpp.um.krakow.pl/web/porta1-podatnika/nieruchomosci-stawki> (access: 30.08.2022).
- Stawki podatku od nieruchomości na rok 2021, Krakowski Portal Podatnika, <https://kpp.um.krakow.pl/web/porta1-podatnika/podatek-od-nieruchomosci-rolny-i-le%9Bny-2021> (access: 30.08.2022).
- Stiglitz J.E., Rosengard J.K.: Economics of the public sector. W.W. Norton Company, New York, London 2015.

- Świątczak K.: Podatek powierzchniowy czy katastralny – system opodatkowania nieruchomości w Polsce, [in:] A. Borcuch, A. Krzysztofek (eds), *Ekonomia, finanse i zarządzanie. Problemy teoretyczne i praktyczne*, AT Wydawnictwo, Kraków 2019, p. 227-228.
- Szydłowski C.: Audyt dochodów z tytułu opłaty miejscowej w wybranych gminach województwa pomorskiego w Polsce, *Zeszyty Naukowe SGGW, Polityki Europejskie, Finanse i Marketing*, 23 (72)/2020. p. 208-221.
- Toshihiro I.: *Principles of Public Finance*, Springer Science Business Media, Singapore 2017.
- Uchwała nr I/27/18 Rady Miejskiej w Łodzi z dnia 28 listopada 2018 r. w sprawie określenia wysokości stawek podatku od nieruchomości, <http://dziennik.lodzkie.eu/legalact/2018/6579/> (access: 30.08.2022).
- Uchwała nr II/7/18 Rady Miejskiej Wrocławia z dnia 22 listopada 2018 r. w sprawie wysokości stawek podatku od nieruchomości, <https://baw.um.wroc.pl/UrządMiastaWroclawia/document/37242/Uchwa%C5%82a-II-7-18> (access: 30.08.2022).
- Uchwała nr LI/8/18 Rady Miejskiej Wrocławia z dnia 22 listopada 2018 r. w sprawie wzorów formularzy informacji oraz deklaracji na podatek od nieruchomości, podatek rolny i podatek leśny oraz ich formatu elektronicznego, warunków i trybu składania za pomocą środków komunikacji elektronicznej, https://edzienniki.duw.pl/WDU_D/2018/6001/akt.pdf (access: 30.08.2022).
- Uchwała Nr LV/1011/VII/2017 Rady Miasta Poznania z dnia 17-10-2017 w sprawie określenia wysokości stawek podatku od nieruchomości na 2018 rok, <https://bip.poznan.pl/bip/uchwaly/uchwala-nr-lv-1011-vii-2017-z-dnia-2017-10-17,71167/> (access: 30.08.2022).
- Uchwała nr LVI/1393/2017 Rady Miasta Stołecznego Warszawy z dnia 19 października 2017 r. w sprawie określenia wysokości stawek podatku od nieruchomości na 2018 rok, http://edziennik.mazowieckie.pl/WDU_W/2017/9653/akt.pdf (access: 30.08.2022).
- Uchwała nr LX/1588/17 Rady Miejskiej W Łodzi z dnia 15 listopada 2017 r. w sprawie określenia wysokości stawek podatku od nieruchomości, http://dziennik.lodzkie.eu/WDU_E/2017/4885/oryginal/akt.pdf (access: 30.08.2022).
- Uchwała Nr LXXIV/1403/VII/2018 Rady Miasta Poznania z dnia 16-10-2018 w sprawie określenia wysokości stawek podatku od nieruchomości na 2019 rok, <https://bip.poznan.pl/bip/uchwaly/uchwala-nr-lxxiv-1403-vii-2018-z-dnia-2018-10-16,77067/> (access: 30.08.2022).
- Uchwała nr LXXIV/2104/2018 Rady Miasta Stołecznego Warszawy z dnia 27 września 2018 r. w sprawie określenia wysokości stawek podatku od nieruchomości na 2019 rok http://edziennik.mazowieckie.pl/WDU_W/2018/9420/akt.pdf (access: 30.08.2022).
- Uchwała nr XV/415/19 Rady Miejskiej Wrocławia z dnia 21 listopada 2019 r. w sprawie wysokości stawek podatku od nieruchomości, https://edzienniki.duw.pl/WDU_D/2019/6974/akt.pdf (access: 30.08.2022).
- Uchwała nr XV/640/19 Rady Miejskiej w Łodzi z dnia 16 października 2019 r. w sprawie określenia wysokości stawek podatku od nieruchomości, <http://dziennik.lodzkie.eu/legalact/2019/5884/> (access: 30.08.2022).
- Uchwała Nr XVIII/300/VIII/2019 Rady Miasta Poznania z dnia 15-10-2019 w sprawie określenia wysokości stawek podatku od nieruchomości na 2020 rok, <https://bip.poznan.pl/bip/uchwaly/uchwala-nr-xviii-300-viii-2019-z-dnia-2019-10-15,80063/> (access: 30.08.2022).

Uchwała nr XXI/537/2019 Rady Miasta Stołecznego Warszawy z dnia 7 listopada 2019 r. w sprawie określenia wysokości stawek podatku od nieruchomości na 2020 r., <https://edziennik.mazowieckie.pl/legalact/2019/13137/> (access: 30.08.2022).

Uchwała nr XXIII/741/20 Rady Miasta Gdyni z dnia 28 października 2020 r. w sprawie określenia wysokości stawek podatku od nieruchomości na terenie Miasta Gdyni, <https://bip.um.gdynia.pl/podatki-i-oplaty-lokalne-w-2021-roku,8486/podatek-od-nieruchomosci-w-2021-roku,559076> (access: 30.08.2022).

Uchwała nr XXXI/1028/20 Rady Miejskiej w Łodzi z dnia 14 października 2020 r. w sprawie określenia wysokości stawek podatku od nieruchomości, https://bip.uml.lodz.pl/files/bip-public/BRM_2020/08_1028.pdf (access: 30.08.2022).

Uchwała nr XXXI/790/20 Rady Miejskiej Wrocławia z dnia 20 listopada 2020 r. w sprawie wysokości stawek podatku od nieruchomości https://edzienniki.duw.pl/WDU_D/2020/6531/akt.pdf (access: 30.08.2022).

Uchwała nr XXXIV/938/17 Rady Miasta Szczecina z dnia 17 października 2017 r. w sprawie stawek podatku od nieruchomości, https://przyjazne-deklaracje.pl/resources/dokumenty/szczecin-podatek-od-nieruchomosci/2019/Szczecin-Podatek_od_nieruchomosci-DN-1-Uchwala-17_10_2017.pdf (access: 30.08.2022).

Uchwała nr XXXIX/1211/2020 Rady Miasta Stołecznego Warszawy z dnia 19 listopada 2020 r. w sprawie określenia wysokości stawek podatku od nieruchomości na 2021 rok https://edziennik.mazowieckie.pl/WDU_W/2020/11547/akt.pdf (access: 30.08.2022).

Uchwała Nr XXXVI/639/VIII/2020 Rady Miasta Poznania z dnia 13-10-2020 w sprawie określenia wysokości stawek podatku od nieruchomości na 2021 rok, <https://bip.poznan.pl/bip/uchwaly/uchwala-nr-xxxvi-639-viii-2020-z-dnia-2020-10-13,82737/> (access: 30.08.2022).

Uchwały w sprawie stawek, PIB Urzędu Miasta Bydgoszczy, <https://bip.um.bydgoszcz.pl/arttykul/1247/570/uchwaly-w-sprawie-stawek> (access: 30.08.2022).

Ustawa z dnia 12 stycznia 1991 roku o podatkach i opłatach lokalnych, Dz.U. z 2022 r. poz. 1452

Ustawa z dnia 13 listopada 2003 roku o dochodach jednostek samorządu terytorialnego, Dz.U. z 2021, poz. 1672 as adem.

Ustawa z dnia 5 czerwca 1998 r. o samorządzie powiatowym, Dz.U. z 2022 r. poz. 1526.

Ustawa z dnia 8 marca 1990 roku o samorządzie gminnym, Dz.U. z 2022 r. poz. 559.

Wykonanie budżetu m.st. Warszawy, PIB m.st. Warszawy, https://bip.warszawa.pl/Menu_przedmiotowe/budzet_polityka_finansowa_v2/wykonanie_budzetu/default.htm (access: 30.08.2022).

Wykonanie Budżetu za 2018 rok, PIB miasta Bydgoszcz, https://archiwumbip.um.bydgoszcz.pl/finanse/budzet_miasta_bydgoszcz/Wykonanie_Bud_etu_Miasta_za_2018_rok/index.htm (access: 30.08.2022).

Wykonanie Budżetu za 2019 rok, PIB miasta Bydgoszcz https://archiwumbip.um.bydgoszcz.pl/finanse/budzet_miasta_bydgoszcz/Wykonanie_Bud_etu_Miasta_za_2019_rok/index.htm (access: 30.08.2022).

Wykonanie Budżetu za 2020 rok, PIB miasta Bydgoszcz https://archiwumbip.um.bydgoszcz.pl/finanse/budzet_miasta_bydgoszcz/Wykonanie_Bud_etu_Miasta_za_2020_rok/index.htm (access: 30.08.2022).

Wykonanie Budżetu za 2021rok, PIB miasta Bydgoszcz <https://bip.um.bydgoszcz.pl/arttykul/916/671/wykonanie-budzetu-miasta-bydgoszczy-za-2021-rok>(access: 30.08.2022).

- Sprawozdania z wykonania budżetu, PIB Urzędu miasta Częstochowy, <https://bip.czestochowa.pl/artykuly/33091/sprawozdania-z-wykonania-budzetu> (access: 30.08.2022).
- Zarządzenie nr 1375/2020 Prezydenta miasta Radomia z dnia 27 marca 2020 r. w sprawie przedłożenia sprawozdania rocznego z wykonania budżetu Gminy miasta Radomia za 2019 rok wraz z informacją o stanie mienia komunalnego, <https://bip.radom.pl/download/69/84444/1375.pdf> (access: 30.08.2022).
- Zarządzenie nr 2347/2021 Prezydenta miasta Radomia z dnia 31 marca 2021 r. w sprawie przedłożenia sprawozdania rocznego z wykonania budżetu Gminy miasta Radomia za 2020 rok, <https://bip.radom.pl/ra/wladze-miasta/zarzadzenia-prezydenta/52975,Nr-23472021-w-sprawie-przedlozenia-sprawozdania-rocznego-z-wykonania-budzetu-Gmi.html> (access: 30.08.2022).
- Zarządzenie nr 3482/2022 Prezydenta miasta Radomia z dnia 28 kwietnia 2022r. w sprawie przedłożenia sprawozdania rocznego z wykonania budżetu Gminy miasta Radomia za 2021 rok, <https://bip.radom.pl/ra/finanse-podatki-lokalne/budzet/wykonanie/57894,ZARZADZENIE-NR-34822022-PREZYDENTA-MIASTA-RADOMIA-z-dnia-28-kwietnia-2022r-w-spr.html> (access: 30.08.2022).
- Zarządzenie nr 387/2019 Prezydenta miasta Radomia z dnia 28 marca 2019 r. w sprawie przedłożenia sprawozdania rocznego z wykonania budżetu Gminy miasta Radomia za 2018 rok wraz z informacją o stanie mienia komunalnego, <https://bip.radom.pl/download/69/76024/Sprawozdaniezwykoniabudzetuza2018rok.pdf> (access: 30.08.2022).

Ocena udziału wpływów z podatku od nieruchomości w dochodach budżetowych wybranych miast Polski w latach 2018-2021

Streszczenie

Celem publikacji była ocena udziału dochodów z tytułu podatku od nieruchomości w ogólnych dochodach do budżetu 14 największych miast w Polsce, których liczba ludności przekraczała 200 tysięcy mieszkańców. Dokonano również oceny stawek podatku od nieruchomości. Podatek od nieruchomości jest jedną z kluczowych danin lokalnych pobieranych przez samorząd terytorialny. Ocenę przeprowadzono przy pomocy metody analitycznej, metody wnioskowania, metody badania dokumentów źródłowych oraz przeglądu literatury. Wyniki badania wskazują, że dochody z podatku od nieruchomości w zależności od miasta stanowiły od 6,31% (w Warszawie) do 13,98% (w Gdańsku) udziału w ogólnych dochodach do budżetu miasta. Uśredniając, można uznać, że podatek od nieruchomości stanowi około 9% ogólnego dochodu do budżetu największych miast w Polsce. Ustalono również, że poziom dochodów zależny jest od wysokości stawek podatku. Ponadto stwierdzono, że występuje znaczne zróżnicowanie pomiędzy największymi miastami w Polsce w udziale dochodów z podatku od nieruchomości w dochodach do budżetu ogółem.

Słowa kluczowe: podatek od nieruchomości, finanse publiczne, dochody samorządów lokalnych

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THE RELATIONSHIP BETWEEN ECONOMIC GROWTH AND MIGRATION IN TERMS OF 14 EUROPEAN UNION COUNTRIES AND TURKEY

Efforts to get rid of poverty cause migration movements that have consequences not only for themselves, but also for future generations. Migration movements affect many economic variables such as human capital, demand, supply, the balance of payments, income distribution, wage level, and national income. The literature on migration is often studied in the economic, political and security fields. This study focuses on the relationship of migration with economic growth. There are studies that determine two-way causality in the relationship between economic growth and migration. It is seen that the country groups specified here can explain these different results.

In this study, our purpose is to investigate whether international migration affects the economic growth of the receiving country. Therefore, the actual relationship between migration and the economic growth rate in terms of economic size using 14 similar European Union countries and Turkey for the period 1978-2019 (with panel data analysis) was tested. It is seen that the test results explain the positive effects of migration in accordance with the literature.

Keywords: economic growth, immigration, unit root, causality, European Union

JEL Codes: F43, F22, C87, C01, N14

Introduction

The increase in welfare achieved with the industrial revolution is not shared equally among all nations and even among all regions within nations. The development differences between both countries and regions continued to increase in the post-war period. These development differences, which are also the subject of development economics, have also shown themselves in issues such as literacy rate, infant mortality rate, number of doctors per capita, job opportunities (which express better living conditions), as well as income level¹.

One of the most important results of development differences between regions is that it causes migration movements. While approximately two-fifths of the world's population lived in poverty in the post-war period, this rate had decreased to one-fifth by the 2000s

¹ H.B. Yavuz, E. Değerlendirmesi E.: Sürdürülebilir Kalkınmada İzleme ve Değerlendirme Perspektifi, Pelikan, Ankara 2019; S.A. Ertaş, A. Hayriye: Kalkınma göstergeleri bakımından Türkiye'nin Avrupa Birliği ülkeleri arasındaki yeri: İstatistiksel bir analiz, Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 48/2016, p. 199-218.; Y. Kubar: Az gelişmiş ve gelişmekte olan ülkelerin kalkınma göstergeleri ile ekonomik büyüme arasındaki ilişki: Bir panel veri analizi (1995-2010), Ardahan Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 2.4/2016, p. 65-99.

due to both international and interregional migration movements. However, considering the increase in the world's population, it is understood that the number of people still living in poverty is very high, and this excess will continue to cause migration movements². As economies grow and nations develop, the problem of poverty makes itself felt more. In terms of development literature, in order to eliminate this problem, it is necessary to eliminate inequalities and provide equal opportunities for everyone³.

Societies that can provide equal opportunities tend to be the center of socio-economic activities⁴. When the studies are examined, the United States of America is seen as the country where equality of opportunity has the most mobility. In fact, this situation has been called the "American Dream"⁵.

The phenomenon of migration, in its simplest definition, is the geographical mobility of individuals. In order to change the socio-economic conditions and to reach better living standards, people leave a certain settlement individually or in groups and go to another settlement to live temporarily or permanently. So, this change of place not only affects the rest of the life of the person, but also emerges as a process that affects the socio-economic status of the next generations⁶.

These migration movements are not only for countries that provide equal opportunity. At the same time, migration from rural areas to urban areas has accelerated with the phenomenon of urbanization. As urban areas grew, the workforce needed was first met by the workforce living in rural areas within the same country. However, as industrialization accelerated, the labor demand of industrialized countries reached a level that could no longer be met by local resources. This level has resulted in the process of promoting international migration. International migration has been demanded by the labor force in underdeveloped countries living in poor living conditions, and industrialized countries have encouraged the migration of specially qualified individuals to meet their labor needs. This incentive has two sources: (1) the income difference between rural areas and urban areas due to high wages, and (2) the excess of job opportunities provided by cities. These two sources have also led to high rates of unemployment in urban areas; thus, unemployment in urban areas is seen as both a cause and consequence of migration⁷.

The phenomenon of migration has many economic consequences for countries. One of these results is human capital mobility, defined as brain drain. Apart from this, the phenomenon of migration increases the demand for domestic goods, increases per capita income by affecting income distribution, and affects the balance of payments⁸.

However, there is no consensus on the economic effects of migration. In other words, economic theories differ on whether the migrating population grows the target country's

² M.P. Todaro, S.C. Smith: Economic Development, Pearson Education, Boston 2015.

³ A.B. Atkinson: Bringing income distribution in from the cold, *The Economic Journal*, 107 (441)/1997, p. 297-321.

⁴ A. Tyree, M. Semyonov, R.W. Hodge: Gaps and glissandos: inequality, economic development, and social mobility in 24 countries, *American Sociological Review*, 1979, p. 410-424.

⁵ J.P.: Ferrie: History lessons: The end of American exceptionalism? Mobility in the United States since 1850, *Journal of Economic Perspectives*, 19.3/2005, p. 199-215.

⁶ Lee E.S.: A theory of migration, *Demography*, 3.1/1966, p. 47-57; H. Haas, S. Castles, M. Miller: *The Age of Migration: International Population Movements in the Modern World* 5th edition, Bloomsbury Publishing, 2019.

⁷ M.P. Todaro, S.C. Smith: Economic Development, Pearson Education, Boston 2015.

⁸ L. Epstein: Some economic effects of immigration: a general equilibrium analysis, *Canadian Journal of Economics*, 1974, p. 174-190.

economy and creates added value. For example, in the neoclassical growth model, it has been stated that migration will negatively affect economic growth because it reduces the amount of wealth per capita. However, in the Romer growth model, it is stated that migration can provide growth due to the contribution it will make to the human capital of the target country. Again, in the theories of endogenous growth, it is stated that the low-paid workforce will increase profitability by reducing a firm's costs and even provide the opportunity to develop new products by directing the firm's resources to R&D activities in the long run⁹.

The phenomenon of migration has not only occurred for the least developed countries or individuals working with the lowest incomes. It is stated that people with a certain income or education level tend to migrate. For example, the study by Caponi showed that individuals working in low-status occupations in Mexico are 14% more likely to migrate than low-income families when they receive social assistance. It has been revealed that the incentive factor here is that the Mexican government's social assistance to the children of low-income families, on the condition that they receive education, increases their desire to emigrate because it eliminates the education level and borrowing constraints. Accordingly, low-skilled workers may find the same employment opportunities in the countries to which they will migrate and achieve similar living standards. However, high-skilled workers may not be able to reach similar living standards due to various losses such as language or social networks when they migrate. Due to human capital stock they will lose, these people may have to work in lower-paid jobs and live with lower standards of living¹⁰.

The phenomenon of migration is not always something that includes negativities. Just as the balance of international trade affects the economy positively, balanced migration will affect the economy positively. For example, Costa et al.¹¹ stated [in their study] that 13% of the American population and 5.2% of the workforce are composed of immigrants, and the share of immigrants in the US national product is around 15%. It is also seen that second-generation immigrants among these immigrants earn higher wages by working in better jobs than first-generation immigrants. Again, it has been revealed that while the phenomenon of immigration decreases local employment in the short term, it increases employment in the long term as it opens new business areas¹².

Literature Review

The literature on migration has expanded significantly, especially since the 1980s. In the literature, various features of migration – such as economic, political, and security – have been focused on. This study has tried to draw attention to the relationship between international migration movements and economic growth.

⁹ Y. Kang, K. Byung-Yeon: Immigration and Economic Growth: Do Origin and Destination Matter?, Working Paper Series 1/2012, p. 1-30.

¹⁰ Adhikari S., Ugo G.: Should I stay or should I go: do cash transfers affect migration?, World Bank Policy Research Working Paper 8525/2018, p. 12-13; V. Caponi: Heterogeneous Human Capital and Migration: who migrates from Mexico to the US?, Annals of Economics and Statistics/Annales d'Économie et de Statistique, 2010, p. 207-234.

¹¹ D. Costa, D. Cooper, H. Shierholz: Facts about immigration and the US economy, Economic Policy Institute, 2014, p. 1-14.

¹² Ibidem.

Tubadji et al.¹³ tested the socio-economic success of immigrants in the Netherlands in the period 2007-2009 in their study. The study by Tubadji et al. concluded that among migrant workers, those with higher levels of education found higher-paying jobs and had better economic outcomes. People who receive adequate education have the same employment and working opportunities as local people. Again, it is stated in the study that there are differences between first- and second-generation immigrants. It has been stated that first-generation immigrants generally earn less income by working in low-skilled jobs because they have a lower education level than second-generation immigrants¹⁴. Similarly, Muysken and Ziesemer¹⁵ stated that immigrants contribute positively to economic growth, provided they are employed. A similar study was conducted by Akbari and Haider¹⁶ for the Canadian economy, considering the period from 2006-2013. In Akbari and Haider's study, it was stated that immigrants with university education contributed more to economic growth than locals. In the distinction made in terms of provinces, it has been concluded that the economic contributions of locals and immigrants living in small cities are also small¹⁷.

In Boubtane, Dumont, and Rault's study¹⁸, the effect of migration on economic growth in 22 OECD countries was tested using the Neoclassical Solow-Swan model. As a result, it is stated that the human capital of immigrants has a significant positive effect on productivity and economic growth. However, it seems possible through the implementation of unique and selective policies regarding immigrants by the countries that achieve this effect. It is understood that active labor market policies should focus on vocational training activities for immigrants; however, it has been concluded that the net effect of this training on the human capital of immigrants is quite low¹⁹.

Ottaviano and Peri²⁰ investigated the effect of immigration (that took place) in the 1990-2004 period on the wages of American workers. To understand the impact, the physical capital and different types of labor used in the Cobb-Douglas production function are taken into account. In the model in which the general equilibrium approach is used, it has been revealed that immigrants cannot replace the domestic workforce with the same characteristics. It has been shown that the reason for this is that immigrants have different skills and, therefore, they have to choose other professions from the domestic workforce with the same characteristics. According to these results, it is revealed that immigrants have positive effects on the wages of locals in the short and long term²¹.

¹³ Tubadji A., Gheasi M., Nijkamp P.: Immigrants' socio-economic achievements and cultural diversity: Economic effects of individual and local cultural capital, *International Journal of Manpower*, 2017, p. 722-724.

¹⁴ Ibidem.

¹⁵ J. Muysken, T.H.W. Ziesemer: A permanent effect of temporary immigration on economic growth, *Applied Economics*, 45.28/2013, p. 4050-4059.

¹⁶ A.H. Akbari, H. Azad: Impact of immigration on economic growth in Canada and in its smaller provinces, *Journal of International Migration and Integration*, 19.1/2018, p. 129-142.

¹⁷ Ibidem.

¹⁸ E. Boubtane, J.-Ch. Dumont, Ch. Rault: Immigration and economic growth in the OECD countries 1986-2006, *IZA Discussion Paper*, 8681/2014, p. 19.

¹⁹ Ibidem.

²⁰ G.I.P. Ottaviano, G. Peri: Rethinking the Effects of Immigration on Wages NBER Working Paper, 12497/2006, p. 34.

²¹ G.I.P. Ottaviano, G. Peri: Rethinking the Effects of Immigration on Wages NBER Working Paper, 12497/2006, p.17-19, 34

An explanatory study on the contribution of skilled migration to economic growth was made by Bashier and Siam²². In the study, the contribution of immigrants to economic growth in Jordan during the 1980-2012 period was analyzed using the Cobb-Douglas production function. According to the results of the analysis, it was concluded that the amount of capital and domestic labor force, which are the independent variables of the Cobb-Douglas production function, positively affected economic growth. Still, although immigrant labor had a positive effect on economic growth, this effect was statistically insignificant. The authors attributed this insignificant effect to the fact that immigrants are unskilled workers and work only in the agricultural sector²³.

In another study, Dustmann et al.²⁴ analyzed the effects of immigrants on the wages of domestic workers in the UK for the period 1997-2005 using the CES production function. As a result of the analysis, it was concluded that the wages of domestic workers working in low-wage groups decreased in accordance with the literature. Still, it did not have a significant effect on the wages of domestic workers working in the high-wage group. This result, following the literature, leads us to the conclusion that immigrants work in unskilled jobs or have low capital stock as human capital²⁵. A similar study was conducted by Manacorda et al.²⁶ for the period 1970-2000. In the study, in which the CES production function was tested using the skilled-unskilled labor distinction, it was concluded that the migration during the period increased the labor supply in the United Kingdom, but did not significantly affect the wages of the domestic labor force. According to this result, migrant workers in the UK do not replace domestic workers. This result shows that there are different results for immigrants who have received university education. Accordingly, immigrants work in unskilled jobs in the United Kingdom²⁷.

One of the studies that tests the effects of immigrants on labor wages separately according to education level is the Llull²⁸ study. The study analyzed the effects of immigrants in the United States of America in the period of 1967-2007 on labor market wages according to education level. Accordingly, immigrants negatively affect the markets in terms of the labor force earning the lowest income. In other words, it causes wage decreases in unskilled jobs. However, this effect decreases in the medium and long term, especially with the immigrants' demand for education. Again, this negative effect in the lower income group is reversed in the upper-income groups (i.e., it causes wage increases)²⁹.

²² Bashier Al-A., Siam J.A.: Immigration and economic growth in Jordan: FMOLS approach, *International Journal of Humanities Social Sciences and Education*, 1.9/2014, p. 87-90.

²³ Ibidem.

²⁴ Ch. Dustmann, T. Frattini, I.P. Preston: The effect of immigration along the distribution of wages, *Review of Economic Studies*, 80.1/2013, p. 145-173.

²⁵ Ibidem, p. 159-166.

²⁶ M. Manacorda, A. Manning, J. Wadsworth: The impact of immigration on the structure of wages: theory and evidence from Britain, *Journal of the European economic association*, 10.1/2012, p. 120-151.

²⁷ Ibidem, p. 145-148.

²⁸ J. Llull: Immigration, wages, and education: A labour market equilibrium structural model, *The Review of Economic Studies*, 2017, p. 1-46.

²⁹ Ibidem, p. 28-29.

In the study of Izquierdo et al.³⁰, the role of immigrants in the realizations obtained in terms of employment, production increase, investments, current account balance and financing of the social security system in Spain between the years 1995-2006 was tested. In the study using the general equilibrium model, it was pointed out that immigration has a positive effect on the elderly population structure of Spain and increases the workforce. However, this increased workforce had negative effects on productivity because immigrants mostly work in unskilled jobs, and this reduces the productivity calculated per worker. When the increase in employment and the decrease in productivity are evaluated together, it is concluded that although the effect on growth is positive, it is limited. It is stated in the study that human capital investments can reduce these negative effects on productivity. It was also stated that immigration positively affected investment, but did not affect savings rates much. Finally, it reveals that the phenomenon of immigration increases retirement expenditures and, therefore, has negative effects on the deficits of the social security system³¹.

In another study, Manole et al.³² analyzed the effect of migration on economic development in 28 European Union member countries for the period 2008-2014. In the analysis, per capita gross domestic product data was used as the development variable. While the results are considered to have an increasing effect on the GDP, it is stated that immigrants are generally paid in unskilled jobs and less than the average domestic worker³³.

Boubtane et al.³⁴ tested the relationship between migration, unemployment and economic growth for the period 1980-2015 in 22 OECD countries with the Granger Causality analysis. In the study, they concluded that immigration does not cause economic growth in France, Iceland, Norway, and the United Kingdom; on the contrary, economic growth increases immigration. In terms of unemployment, it is stated that immigration causes unemployment in Portugal, but immigration does not affect employment in other countries. A causal relationship was found not from migration to economic conditions, but from economic conditions to migration. In other words, the economic conditions of the countries and the immigration policies they implement affect migration to those countries. As a matter of fact, some countries want immigration, albeit limited, in order to provide labor supply because of their aging population. In countries where such policies are implemented, migration does not have a negative impact on the labor market. Again, it was concluded that more immigration from such countries would positively affect the economic results³⁵.

Peter and Verikios³⁶ tested the effect of immigrants who came to Australia in the years 1991-1992 on the incomes of residents using the standard neoclassical model.

³⁰ M. Izquierdo, J.F. Jimeno, J.A. Rojas: On the aggregate effects of immigration in Spain, *SERIEs*, 1.4/2010, p. 409-432.

³¹ *Ibidem*, p. 422-430.

³² S. Manole, L. Pănoiu, A. Păunescu: Impact of migration upon a receiving country's economic development, *Amfiteatru Economic*, 19.46/2017, p. 670.

³³ *Ibidem*, p. 676-678.

³⁴ E. Boubtane, J.-Ch. Dumont, Ch. Rault: Immigration and economic growth in the OECD countries 1986-2006, *IZA Discussion Paper*, 8681/2014, p. 18-19.

³⁵ *Ibidem*, p. 16-22.

³⁶ M.W. Peter, G. Verikios: The effect of immigration on residents' incomes in Australia: Some issues reconsidered, *Australian Economic Review*, 29.2/1995, p. 171-188.

Neoclassical theory states that an increase in employment will increase national income; however, there are many important factors that determine the relationship between migration and income growth. In terms of the Australian economy, the amount of foreign capital and publicly owned capital comes to the fore in determining this relationship. In the study, it is assumed that the workforce is homogeneous. For this reason, the assumption in the literature that immigrants have an unskilled labor force is abandoned here. As a result, it has been concluded that the migration movement has a positive effect on national income, but the amount of this effect in terms of the Australian economy is determined by capital ownership³⁷.

Research material and methodology

In this study, the relationship between economic growth and migration in 14 European Union Countries and Turkey has been examined. The data on the variables used in the study were obtained from the World Bank database. The GDP variable, which is determined as the dependent variable, is the annual growth rate of the GDP calculated at constant prices in national currency. Again, the migration variable was calculated as the annual total net migration. This variable is obtained by subtracting immigration from the total number of immigrants. In the study, panel data analysis was conducted on the variables calculated by taking five-year averages covering the period 1972-2019. The study covers 14 European Union countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and Sweden) and Turkey.

The model considered in the study is: $GDP_{it} = \alpha_i + \gamma_i t + \beta_i GOC_{it} + \varepsilon_{it}$

Where:

GDP = Gross Domestic Product Growth rate;

GOC = immigration rate;

α_i = Countries;

γ_i = Trend effect;

β_i = estimate parameter;

ε_{it} = Error term;

$t = 1, 2, \dots, T$ time period;

$i = 1, 2, \dots, N$ the number of observations.

There are some points to be considered while performing panel data analysis. First, unit root tests are used to determine whether variables are stationary because it will also be determined whether the analyses made with non-stationary series reveal an imitative regression relationship. Second, most panel data applications assume that the series is homogeneous; therefore, this assumption also needs to be tested. Consequently, the homogeneity test should be applied to determine whether the slope coefficients in the model are different between the horizontal sections.

³⁷ Ibidem, p. 13-16.

The Delta Homogeneity test developed by Pesaran and Yamagata³⁸ was used in the study. This test, $Y_{it} = \alpha_i + \beta_i X_{it} + \varepsilon_{it}$, is calculated with the equation. Where:

$i = 1, 2, \dots, N$ and $t = 1, 2, \dots, T$;

$H_0: \beta_i = \beta \rightarrow$ The slope coefficient for all β_i is homogeneous;

$H_1: \beta_i \neq \beta \rightarrow$ The slope coefficient for at least one 'i' is not homogeneous.

Cross-section dependency tests developed by Pesaran³⁹ were used to determine whether there is a cross-sectional dependence between the series. Since the H_0 hypothesis was rejected in this test, the presence of cross-section dependence was determined, and second-generation tests were used.

One of the unit root tests for the variables used in the study recommended by Levin et al.⁴⁰ and Im et al.⁴¹ (IPS) were used.

The establishment of hypotheses in these tests and the calculation of test statistics are based on the Dickey-Fuller (1979) and Extended Dickey-Fuller (ADF) unit root tests. In these tests, the autoregressive (ρ) coefficient is accepted as homogeneous for all units in the Levin et al.⁴² test, but the coefficient is allowed to be heterogeneous in the Im et al.⁴³ test. In the IPS test, the unit root test is applied to the time series separately for each unit without combining the data, and the IPS test statistics are obtained by taking the average of the statistics obtained⁴⁴.

After the unit root tests, cointegration tests were applied to determine the existence of a long-term relationship between the series. Among these tests, Pedroni⁴⁵, Kao⁴⁶ and Johansen Fisher cointegration tests were used.

It is estimated in the Pedroni⁴⁷ cointegration test, Panel v-statistics, Panel rho-statistics, Panel pp-statistics, and Panel ADF-statistics are used as "within" estimators, and Group rho-statistics, Group pp-statistics, and Group ADF-statistics as "between" estimators.

Similarly, Kao⁴⁸ and Johansen Fisher Panel cointegration tests were also performed. Kao⁴⁹ suggested the result of the ADF test statistic to test the hypothesis of H_0 : there is no

³⁸ M.H. Pesaran, T. Yamagata: Testing slope homogeneity in large panels, *Journal of econometrics*, 142.1/2008, p. 50-93.

³⁹ M.H. Pesaran: General diagnostic tests for cross section dependence in panels, *Cambridge Working Papers in Economics*, 0435/2004, p. 9.

⁴⁰ A. Levin, Lin Ch.-F., Ch.-Sh.J. Chu: Unit root tests in panel data: asymptotic and finite-sample properties, *Journal of Econometrics*, 108, (1)/2002, p. 1-24.

⁴¹ K.S. Im, M. Pesaran, Y. Shin: Testing for unit roots in heterogeneous panels, *Journal of Econometrics*, 115, (1)/2003, p. 53-74.

⁴² A. Levin, Lin Ch.-F., Ch.-Sh.J. Chu: Unit root tests..., *op. cit.*, 2022, p. 1-24.

⁴³ K.S. Im, M. Pesaran, Y. Shin: Testing for unit..., *op. cit.*, 2003, p. 53-74.

⁴⁴ S. Güven, M. Mert: Uluslararası Turizm Talebinin Eşbütünleşme Analizi: Antalya İçin Panel Ardl Yaklaşımı, *Cumhuriyet Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 17.1/2016, p. 141-142.

⁴⁵ P. Pedroni: Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors, *Oxford Bulletin of Economics and Statistics*, 61/1999, p. 653-670, <https://doi.org/10.1111/1468-0084.61.s1.14>

⁴⁶ C. Kao: Spurious Regression and Residual-Based Tests for Cointegration in Panel Data, *Journal of Econometrics* 90/1999, p. 144.

⁴⁷ P. Pedroni: Critical Values for..., *op. cit.*, 1999, p. 653-670.

⁴⁸ C. Kao: Spurious Regression and..., *op. cit.*, 1999, p. 144.

⁴⁹ Ibidem.

cointegration between the variables. A lagged value of 1 was used in the Johansen Fisher Panel cointegration test.

In the study, analyses were made with the Gauss 10 and Eviews 11 package programs.

Research results

The results of the Delta homogeneity test, which was developed by Pesaran and Yamagata⁵⁰ in the study, are given in Table 1.

Table 1. Delta Homogeneity Test Results

N=15 T=10		
Test	Test Statistic	p-value
Delta tilde	1.671	0.047
Delta tilde adj	1.960	0.025

Source: Gauss 10 package program application result.

According to these test results, the H_0 hypothesis – which states that the slope coefficient is homogeneous – is rejected. This result shows that the slope coefficients for each β_i are heterogeneous. In this case, it can be said that the cointegration tests that we will do separately for each section are reliable and valid.

In the second stage of the study, the results of the test performed to determine whether there is a cross-sectional dependence between the variables are given in Table 2.

Table 2. Horizontal Cross-Section Dependence Test

N=15 T=10		
CD-Test for GDP	Test Statistic	p-value
CD LM1 (Breusch, Pagan, 1980)	210.770	0.000
CD LM2 (Pesaran 2004, CDLM)	7.299	0.000
CD LM (Pesaran, 2004 CD test)	-1.414	0.079
CD-Test for GOC	Test Statistic	p-value
CD LM1 (Breusch, Pagan, 1980)	201.995	0.000
CD LM2 (Pesaran 2004, CDLM)	6.693	0.000
CD LM (Pesaran, 2004 CD test)	0.147	0.442

Source: Eviews 11 package program application result.

The test results show that the H_0 hypothesis is rejected. This result, which shows that there is a cross-section dependency between the variables, can be interpreted as a development in one country that may affect other countries as well.

⁵⁰ M.H. Pesaran, T. Yamagata: Testing slope homogeneity in large panels, Journal of econometrics, 142.1/2008, p. 50-93.

In the third stage of the study, the unit root test results used to examine the stationarity of the variables in the model are given in Table 3.

According to the Fisher ADF and PP unit root test results given above, the H_0 hypothesis that all panels contain unit root is rejected. This result indicates that the series is stationary (i.e., they do not contain a unit root). In other words, a change in the GOC variable will permanently affect the GDP variable.

Table 3. Levin et al. and Im et al. Unit Root Test Results

Series: GDP		
H ₀ : All panels contain a unit root		
H ₁ : At least one panel is stationary.		
Method	Statistic	Probability
Levin, Lin and Chu	-9.49999	0.0000
Breitung t-Stat	-3.09016	0.0010
Im, Pesaran and Shin W-stat	-2.16094	0.0153
ADF-Fisher χ^2	68.4053	0.0001
PP-Fisher χ^2	120.317	0.0000
Seri: GOC		
H ₀ : All panels contain a unit root		
H ₁ : At least one panel is stationary.		
Method	Statistic	Probability
Levin, Lin and Chu	-9.51645	0.0000
Breitung t-Stat	-3.98440	0.0000
Im, Pesaran and Shin W-stat	-1.44839	0.0738
ADF-Fisher χ^2	53.8534	0.0048
PP-Fisher χ^2	54.1155	0.0045

Source: Eviews 11 package program application result; Levin A., Ch.-F. Lin, Chu Ch.-Sh.J.: Unit root tests in panel data: asymptotic and finite-sample properties, *Journal of Econometrics*, 108, (1)/2002, p. 1-24; Im K.S., Pesaran M., Shin Y.: Testing for unit roots in heterogeneous panels, *Journal of Econometrics*, 115, (1)/2003, p. 53-74.

According to the Fisher ADF and PP unit root test results given above, the H_0 hypothesis that all panels contain unit root is rejected. This result indicates that the series is stationary (i.e., they do not contain a unit root). In other words, a change in the GOC variable will permanently affect the GDP variable.

Finally, Pedroni, Kao and Johansen Fisher cointegration tests were conducted to investigate the existence of a long-term relationship between the variables. The results of these tests are given in the Table 4. According to the results of Pedroni's⁵¹ cointegration test given in Table 4, since the p-value of the statistics other than the Panel v-statistics and the Group rho statistics is less than 0.01, we can say that it is significant at a level of 1%. In this case, we can reject the H_0 hypothesis – which is expressed as there is no cointegration between the variables. As a result, it will be accepted that there is a cointegration relationship between migration and growth variables in the long run.

⁵¹ P. Pedroni: Critical Values for..., *op. cit.*, 1999, p. 653-670.

Table 4. Pedroni Cointegration test results

Series: GDP GOC				
Included observations: 150				
Cross-sections included: 15				
Null Hypothesis: No cointegration				
Trend assumption: No deterministic trend				
Automatic lag length selection based on SIC with a max lag of 1				
Newey-West automatic bandwidth selection and Bartlett kernel				
Alternative hypothesis: common AR coefs. (within-dimension)				
	statistic	prob.	weighted Statistic	prob.
Panel v-Statistic	-0.764758	0.7778	-0.895890	0.8148
Panel rho-Statistic	-2.777184	0.0027	-2.705482	0.0034
Panel PP-Statistic	-10.18377	0.0000	-9.705776	0.0000
Panel ADF-Statistic	-9.444207	0.0000	-8.861221	0.0000
Alternative hypothesis: individual AR coefs. (between-dimension)				
Group rho-Statistic	-0.750652	0.2264		
Group PP-Statistic	-12.46450	0.0000		
Group ADF-Statistic	-9.721558	0.0000		

Source: Eviews 11 package program application result.

Table 5. Kao Test Statistics Results

Kao Residual Cointegration Test		
Series: GDP GOC		
Included observations: 150		
Null Hypothesis: No cointegration		
Trend assumption: No deterministic trend		
Automatic lag length selection based on SIC with a max lag of 1		
Newey-West automatic bandwidth selection and Bartlett kernel		
	t-Statistic	Prob.
ADF	-3.311123	0.0005

Source: Eviews 11 package program application result.

According to Kao⁵², because of the cointegration test results given in Table 5, at a 1% significance level, the H_0 hypothesis is rejected. This result shows that the variables come to equilibrium by acting together in the long run.

⁵² C. Kao: Spurious Regression and..., *op. cit.*, 1999, p. 144.

Table 6. Johansen Fisher Panel Cointegration Test Results

Johansen Fisher Panel Cointegration Test				
Series: GDP GOC				
Included observations: 150				
Trend assumption: Linear deterministic trend				
Lags interval (in first differences): 1 1				
Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)				
Hypothesized	Fisher Stat.*		Fisher Stat.*	
No. of CE(s)	(from trace test)	Prob.	(from max-eigen test)	Prob.
None	87.06	0.0000	79.70	0.0000
At most 1	48.27	0.0186	48.27	0.0186

* Probabilities are computed using asymptotic χ^2 distribution.

Source: Eviews 11 package program application result.

As in the other two tests, the Johansen Fisher cointegration test results also indicate a long-term relationship between the variables.

Conclusion

The fact that the increase in welfare achieved after the industrial revolution could not be shared equally caused wars, social unrest, and migration movements. The center of these migration movements is generally towards developed countries that provide more equal opportunities.

Migration has features that affect not only immigrants, but also future generations, increases the demand for domestic goods, the gross domestic product, and improves the balance of payments by causing human capital mobility.

Different economic theories explain the effects of migration differently. For example, while neoclassical theory talks about the negative effects of migration because it reduces the capital stock per capita, Romer argues that it has positive results in the growth model due to its contribution to human capital. Again, the endogenous growth theories, which consider wage levels, say that they positively affect economic growth due to the low-paid workforce. Despite these different implications, the literature concludes that a balanced migration movement can positively affect the economy through the policies to be implemented.

Differences in the human capital of migrants are the main differences that explain the economic effects of migration. For example, unskilled labor migration appears to provide a substitute for low-wage workers in the country of origin while increasing the wage level in high-paid jobs. In other words, while migration causes wage decreases in unskilled jobs, it causes wage increases in skilled jobs. In general equilibrium models, this is explained by looking at the total effect. In other words, since the amount of labor increases with the migration movement, but the productivity decreases, the economic effects are evaluated in terms of the total impact.

As a result of working following the literature, we can say that a positive development in one country in terms of countries with similar economic conditions also affects other

countries, and they become a center of attraction in terms of migration movements. In addition, the migration movement does not only have consequences for the migrant. This has consequences for the person's family, that is, for future generations. Therefore, we can say that migration has positive and long-term effects on economic growth. In other words, migration and growth variables show a cointegration relationship in the long run.

References

- Adhikari S., Ugo G.: Should I stay or should I go: do cash transfers affect migration?, World Bank Policy Research Working Paper 8525/2018, p. 1-25.
- Akbari A.H., Azad H.: Impact of immigration on economic growth in Canada and in its smaller provinces, *Journal of International Migration and Integration*, 19.1/2018, p. 129-142.
- Atkinson A.B.: Bringing income distribution in from the cold, *The Economic Journal*, 107 (441)/1997, p. 297-321.
- Bashier Al-A., Siam J.A.: Immigration and economic growth in Jordan: FMOLS approach, *International Journal of Humanities Social Sciences and Education*, 1.9/2014, p. 85-92.
- Boubtane E., Coulibaly D., Rault Ch.: Immigration, unemployment and GDP in the host country: Bootstrap panel Granger causality analysis on OECD countries, *Economic Modelling*, 33/2013, p. 261-269.
- Boubtane E., Dumont J.-Ch., Rault Ch.: Immigration and economic growth in the OECD countries 1986-2006, IZA Discussion Paper, 8681/2014, p. 1-34.
- Caponi V.: Heterogeneous Human Capital and Migration: who migrates from Mexico to the US?, *Annals of Economics and Statistics/Annales d'Économie et de Statistique*, 2010, p. 207-234.
- Costa D., Cooper D., Shierholz H.: Facts about immigration and the US economy, Economic Policy Institute, 2014, p. 1-14.
- DataBank, World Development Indicators, <https://databank.worldbank.org/source/world-development-indicators> (access: 14.12.2022).
- Dustmann Ch., Frattini T., Preston I.P.: The effect of immigration along the distribution of wages, *Review of Economic Studies*, 80.1/2013, p. 145-173.
- Epstein L.: Some economic effects of immigration: a general equilibrium analysis, *Canadian Journal of Economics*, 1974, p. 174-190.
- Ertuş S.A., Hayriye A.: Kalkınma göstergeleri bakımından Türkiye'nin Avrupa Birliği ülkeleri arasındaki yeri: İstatistiksel bir analiz, *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 48/2016, p. 199-218.
- Ferrie J.P.: History lessons: The end of American exceptionalism? Mobility in the United States since 1850, *Journal of Economic Perspectives*, 19.3/2005, p. 199-215.
- Güven S., Mert M.: Uluslararası Turizm Talebinin Eşbütünleşme Analizi: Antalya İçin Panel Ardl Yaklaşımı, *Cumhuriyet Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 17.1/2016, p. 133-152.
- Haas H., Castles S., Miller M.: *The Age of Migration: International Population Movements in the Modern World* 5th edition, Bloomsbury Publishing, 2019.
- Im K.S., Pesaran M., Shin Y.: Testing for unit roots in heterogeneous panels, *Journal of Econometrics*, 115, (1)/2003, p. 53-74.
- Indicators of sustainable development: guidelines and methodologies, United Nations, 2007.
- Isaacs J.B., Sawhill I.V., Haskins R.: *Getting ahead or losing ground: Economic mobility in America*, Brookings Institution, 2008.
- Izquierdo M., Jimeno J.F., Rojas J.A.: On the aggregate effects of immigration in Spain, *SERIEs*, 1.4/2010, p. 409-432.
- Kang Y., Byung-Yeon K.: Immigration and Economic Growth: Do Origin and Destination Matter?, CEI Working Paper Series 1/2012, p. 1-30.

- Kao C.: Spurious Regression and Residual-Based Tests for Cointegration in Panel Data, *Journal of Econometrics* 90/1999, p. 144.
- Kubar Y.: Az gelişmiş ve gelişmekte olan ülkelerin kalkınma göstergeleri ile ekonomik büyüme arasındaki ilişki: Bir panel veri analizi (1995-2010), *Ardahan Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 2.4/2016, p. 65-99.
- Lee E.S.: A theory of migration, *Demography*, 3.1/1966, p. 47-57.
- Levin A., Ch.-F. Lin, Chu Ch.-Sh.J.: Unit root tests in panel data: asymptotic and finite-sample properties, *Journal of Econometrics*, 108, (1)/2002, p. 1-24.
- Llull J.: Immigration, wages, and education: A labour market equilibrium structural model, *The Review of Economic Studies*, 2017, p. 1-46.
- Manacorda M., Manning A., Wadsworth J.: The impact of immigration on the structure of wages: theory and evidence from Britain, *Journal of the European economic association*, 10.1/2012, p. 120-151.
- Manole S., Pănoiu L., Păunescu A.: Impact of migration upon a receiving country's economic development, *Amfiteatru Economic*, 19.46/2017, p. 670-681.
- Muysken J., Ziesemer T.H.W.: A permanent effect of temporary immigration on economic growth, *Applied Economics*, 45.28/2013, p. 4050-4059.
- Ottaviano G.I.P., Peri G.: Rethinking the Effects of Immigration on Wages NBER Working Paper, 12497/2006, p. 1-54.
- Pedroni P.: Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors, *Oxford Bulletin of Economics and Statistics*, 61/1999, p. 653-670, <https://doi.org/10.1111/1468-0084.61.s1.14>
- Pesaran M.H.: General diagnostic tests for cross section dependence in panels, *Cambridge Working Papers in Economics*, 0435/2004, p. 1-42.
- Pesaran M.H.: A simple panel unit root test in the presence of cross-section dependence, *Journal of applied econometrics*, 22.2/2007, p. 265-312.
- Pesaran, M.H., Yamagata T.: Testing slope homogeneity in large panels, *Journal of econometrics*, 142.1/2008, p. 50-93.
- Pesaran, M.H.: Estimation and inference in large heterogeneous panels with a multifactor error structure, *Econometrica*, 74.4/2006, p. 967-1012.
- Peter M.W., Verikios G.: The effect of immigration on residents' incomes in Australia: Some issues reconsidered, *Australian Economic Review*, 29.2/1995, p. 171-188.
- Sevinç H., Bozkurt E., Künu S., Sevinç D.E.: Ekonomik büyüme ve göç ilişkisi: Gelişmekte olan ülkelere dayalı bir analiz, *International Conference on Eurasian Economies*, 2016, p. 398-403.
- Todaro M.P., Smith S.C.: *Economic Development*, Pearson Education, Boston 2015.
- Todaro M.P.: A model of labor migration and urban unemployment in less developed countries, *The American Economic Review*, 59.1/1969, p. 138-148.
- Tubadji A., Gheasi M., Nijkamp P.: Immigrants' socio-economic achievements and cultural diversity: Economic effects of individual and local cultural capital, *International Journal of Manpower*, 2017, p.712-728
- Tyree A., Semyonov M., Hodge R.W.: Gaps and glissandos: inequality, economic development, and social mobility in 24 countries, *American Sociological Review*, 1979, p. 410-424.
- United Nations Development Programme. Evaluation Office. Handbook on monitoring and evaluating for results, Evaluation Office, United Nations, 2002.
- Yavuz H.B., Değerlendirmesi E.: *sürdürülebilir Kalkınmada İzleme ve Değerlendirme Perspektifi*, Pelikan, Ankara 2019.

Związek pomiędzy wzrostem gospodarczym a migracją w ujęciu Unii Europejskiej i Turcji

Streszczenie

Ruchy migracyjne wpływają na wiele zmiennych ekonomicznych, takich jak kapitał ludzki, popyt, podaż, bilans płatniczy, podział dochodów, poziom płac i dochód narodowy. W literaturze przedmiotu migracje są często badane pod kątem ekonomicznym, politycznym i bezpieczeństwa. Niniejsze opracowanie koncentruje się na związku migracji ze wzrostem gospodarczym. Istnieją badania, które określają dwukierunkową przyczynowość w relacji pomiędzy wzrostem gospodarczym a migracją. Widać, że określone tu grupy krajów mogą wyjaśnić te różne wyniki.

W tym badaniu testowano rzeczywiste relacje między migracją a tempem wzrostu gospodarczego w ujęciu wielkości ekonomicznej przy użyciu podobnych 14 krajów Unii Europejskiej i Turcji dla okresu 1978-2019 z panelową analizą danych. Widać, że wyniki testu wyjaśniają pozytywne efekty migracji zgodnie z literaturą.

Słowa Kluczowe: wzrost gospodarczy, imigracja, pierwiastek jednostkowy, przyczynowość, Unia Europejska

JEL Codes: F43, F22, C87, C01, N14

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LOCAL POLISH SELF-GOVERNMENTS AGAINST THE CHALLENGES CREATED BY THE RISK OF NON-FINANCIAL FACTORS (ESG)

The article aims to systematize the state of knowledge about the risk of ESG factors in the Polish local government. The risk of climate change, energy transformation, population aging or pandemic risk is just an example of this affecting local government units (LGUs). In particular, the article presents the areas of public services provided by local governments most sensitive to ESG risk. Attention was paid to the adjustment mechanism and actions taken by the local government in Poland to reduce the negative impact of ESG risk on the activity of local government units and the stability of their budgets. The issues of the impact of EU regulations relating to “low-emission” and affecting public transport were presented, as well as the problems related to activities for the energy transformation or the fight against smog. The article uses critical literature analysis, comparative methods, observation, induction, and deduction methods. The study is one of the first to discuss the role and risk place of ESG factors in the activities of local government units.

Keywords: risk, ESG, self-government, public services

JEL codes: H72, M42

Introduction

The risk of non-financial factors is one of the most significant risk categories taking into account the strength of its impact and the probability of its occurrence¹. This type of risk is also called ESG risk (environmental, social, governance) or the risk of sustainable development². It occurs and is co-created by environmental, social, and governance mapped to individual pillars and Sustainable Development Goals (SDGs). Climate risk or pandemic risk are only selected types of non-financial risk present in the activities of business entities, including local government units. In the literature on the subject, much attention is paid to ESG risk (particularly in the context of its impact on the financial situation of enterprises, e.g., Friede et al.³). However, its effect on the decisions and activity of local

¹ The Global Risks Report 2022 17th Edition – INSIGHT REPORT, World Economic Forum, 2022, <https://www.weforum.org/reports/global-risks-report-2022/> (access: 05.04.2022).

² L. Zu: Sustainability Risk Management, [in:] S.O. Idowu, N. Capaldi, L. Zu, A.D. Gupta (eds), Encyclopedia of Corporate Social Responsibility, Springer, Berlin, Heidelberg 2013, https://doi.org/10.1007/978-3-642-28036-8_257

³ G. Friede, T. Busch, A. Bassen: ESG and financial performance: aggregated evidence from more than 2000 empirical studies, Journal of Sustainable Finance & Investment, 5, 4/2015, p. 210-233, <https://doi.org/10.1080/20430795.2015.1118917>

government (including local government units) in Poland is still poorly recognized. The study attempts to fill this gap. Undoubtedly, due to the effects and threats related to the presence of ESG risk in the contemporary environment, market participants must take adaptive measures, including integrating non-financial risk into the risk management system and decision-making processes⁴. Such activities take place either on the initiative of the entities at risk of this risk or are initiated as a result of systemic solutions adopted at the level of the European Union (EU) (the EU is currently the most advanced in terms of works and adopted strategic documents aimed at reducing negative changes determined by risk) climate, including “Fit for 55”, Taxonomy as a consequence of the European Green Deal⁵) and, consequently, its Member States. The article aims to systematize the state of knowledge about the risk of non-financial factors in the Polish local government; in particular, the study indicates the areas of activity of local government units exposed to ESG risk, its potential consequences, and instruments for reducing this risk. The paper is organized as follows: the introduction is Section 1; Section 2 presents the theoretical aspects related to ESG risk in Polish local government; Section 3 describes the methodological approach; Section 4 discusses the impact of ESG risk on local government and the main tools of its mitigation; Section 5 is the conclusion.

Theoretical framework

Relatively few studies that directly refer to the issue of ESG risk in the Polish local government have been published so far⁶. The risk of non-financial factors has two dimensions and manifests itself as the so-called “transition risk” (regulations, technologies, market sentiment) and physical risk (emergencies, chronic events)⁷. The local government has to deal with the first and second risk categories. As an example of physical risk, one can mention sudden weather events causing crises (e.g., the destruction of infrastructure strategies for local government units). The risk of transition is expressed by undertaking transformative measures and adapting to functioning in ESG conditions (e.g., climate change). In the case of local government, the leading role in this respect is played by regulations (e.g., provisions resulting from the concept of the European Green Deal [including sustainable urban transport]). Today, local government units in Poland are obliged to prepare plans for adaptation to climate change⁸. The COVID-19 pandemic is also one of the manifestations of the risk of non-financial factors. During the pandemic, local Polish governments took several actions to support, in particular: 1) the healthcare system; 2) local entrepreneurs; 3) social welfare institutions; 4) residents (the elderly, the sick, the disabled,

⁴ B. Hübel, H. Scholz: Integrating Sustainability Risks in Asset Management: The Role of ESG Exposures and ESG Ratings, *Journal of Asset Management* 21 (1)/2020, p. 52-69, <http://dx.doi.org/10.2139/ssrn.3091666>

⁵ On July 14, 2021, the European Commission approved the ‘Fit for 55’ package as part of the European Green Deal aimed at the implementation of measures leading to climate neutrality, More: Pakiet „Fit for 55”. Działania legislacyjne UE dla klimatu, <https://www2.deloitte.com/pl/pl/pages/zarzadzania-procesami-i-strategiczne/artikles/pakiet-fit-for-55.html> (access: 12.08.2022).

⁶ M. Ziolo (ed.): *Finanse. Finanse publiczne*, Polska Akademia Nauk, Warszawa 2020; M. Ziolo: *Finanse zrównoważone. Rozwój, ryzyko, rynek*, PWE, Warszawa 2020; K. Wójtowicz: *Uwarunkowania i pomiar stabilności fiskalnej jednostek samorządu terytorialnego*, Wyd. UMCS, Lublin 2019, p. 162-204.

⁷ Olech, D., Flak P. (2021). EBA pyta banki o praktykę zarządzania ryzykiem ESG i wskazuje kierunki, *Biuletyn Ryzyka*, 1, p. 1, https://www.ey.com/pl_pl/biuletyn-ryzyka/eba-pyta-banki-o-praktyke-zarzadzania-ryzykiem-esg-i-wskazuje-kierunki (access: 18.08.2022).

⁸ Ustawa z dnia 8 marca 1990 r. o samorządzie gminnym, Dz.U. 2022r. poz. 559, as amended.

people in isolation or quarantine)⁹. Much attention has been paid in the literature to the issue of the influence of COVID-19 on local government units. It is worth mentioning here the publications analyzing the impact of COVID-19 on local government finances¹⁰. In the analysis, the authors indicate negative trends in local finances and an urgent need for changes (e.g., lifting the limitations in shaping the structure of local government spending¹¹), real estate tax reforms (differentiation of maximum rates depending on the wealth of the region or its size), or increasing the base amount of the educational subsidy¹². Apart from the pandemic risk, an important trend of research in the field of ESG/ local government units concerns the impact of climate risk on local government. The publications in this scope are varied and refer to, among other things, low-carbon urban transport¹³ and the broader low-carbon economy of the region¹⁴, as well as low-carbon and energy efficiency¹⁵. The analyses show Poland's large cities (over PLN 50,000 inhabitants) have low-emission economy plans. In local government units, construction (public utility buildings and residential buildings) and transport are among the sectors with the highest share of greenhouse gas (GHG) emissions and final energy consumption¹⁶. As U. Motowidlak points out¹⁷, transportation is one of the most difficult-to-control sectors concerning CO₂ emissions; therefore, thanks to integrated mobility plans, cities can significantly contribute to reducing GHG (e.g., by financing and implementing low-carbon transport solutions). Regarding construction, territorial self-governments face a difficult challenge related to the thermal modernization of public buildings. The first organizational solutions have already been developed and consist of the public-private partnership formula¹⁸. Waste management is an important area of local government activity, subject to regulations and, at the same time, sensitive to ESG risk. An in-depth discussion is currently underway on the impact of the climate and energy legislative package "Fit for 55" on waste management. A particular challenge for Polish local governments in this context is the implementation of the principles of a circular economy based on the processing – not storage – or incineration of waste (i.e., solutions dominant in Polish local government units¹⁹).

⁹ M. Klimek: Funkcjonowanie jednostek samorządu terytorialnego podczas pandemii COVID-19, *Studia Polityczne*, 64/2022, p. 1.

¹⁰ P. Swianiewicz, J. Łukomska: *Finanse samorządu terytorialnego w dobie pandemii*, Fundacja Batorego, Warszawa 2020; E. Malinowska-Misiąg: *Finanse jednostek samorządu terytorialnego w Polsce w pierwszym roku pandemii*, *Optimum Economic Studies*, 1 (107)/2022, p. 7-32.

¹¹ *Ibidem*.

¹² *Ibidem*.

¹³ U. Motowidlak: Rola transportu miejskiego w realizacji celów gospodarki niskoemisyjnej, *Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach*, 249/2015, p. 172-184.

¹⁴ S. Jankiewicz: Gospodarka niskoemisyjna jako podstawa rozwoju regionu, *Nierówności Społeczne a Wzrost Gospodarczy*, 49, (1)/2017, p. 160-167.

¹⁵ I. Rackiewicz I. (ed.): *Niskoemisyjność i efektywność energetyczna. Raport o stanie polskich miast*, Instytut Rozwoju Miast, Kraków 2017, p. 9-60.

¹⁶ *Ibidem*.

¹⁷ U. Motowidlak: Rola transportu..., 2015, *op. cit.*, p. 172-184.

¹⁸ Modernizacja energetyczna obiektów użyteczności publicznej w Płocku, <https://www.ppp.gov.pl/efektywnosc-energetyczna/> (access:18.08.2022).

¹⁹ Pakiet „Fit for 55”. Jak wpłynie na samorzady? *Forum Ekonomiczne 2022*, <https://www.forum-ekonomiczne.pl/pakiet-fit-for-55-jak-wplynie-na-samorzady/> (accessed: 18.08.2022).

Methodology

The article is informative and review-based. The study uses the triangulation method, in particular: the analysis and criticism of the literature, the technique of examining documents, the method of analysis and logical construction, and the comparative method. Methodological triangulation refers to a situation where research uses several or different research techniques within one research method²⁰. The triangulation method ensures the reliability of the research approach and the acquisition of comprehensive and contextual knowledge about the phenomenon. Triangulation increases cognitive abilities concerning the studied phenomena²¹.

The impact of the risk of non-financial factors on local government and the main tools of its mitigation

As part of the ESG risk in the literature and public debates, the greatest attention is paid to environmental risk (E)²². Public services provided by the local government that are most sensitive to the disclosure of physical, weather, and hydrological events resulting from climatic changes include public safety and order, health protection, social assistance, municipal services, including technical and social infrastructure, as well as transport. Furthermore, the negative consequences of self-government can arise from the worsening economic situation of enterprises and farms caused by property damage, disruption of supply chains, and difficulties related to logistics, workforce, and sales (see Table 1). Environmental risks to local governments lie in the waste and pollution of natural resources such as water and clean air²³. The potential impact of environmental risks on local water management is related to low water availability in Poland (on average, approximately 1,600m³ per inhabitant, compared to the EU average of 4,500m³)²⁴. From the point of view of local authorities, the low water capacity of the retention ponds is disadvantageous (on average, at 6% of the long-term runoff compared to 10% for the countries neighboring Poland)²⁵. Furthermore, many local governments report problems associated with poor water quality. The environmental risk also materialized for LGUs in air pollution (so-called “smog”). Its sources include low municipal and housing emissions, pollution from point sources (electricity and industrial plants), and transport. All this has a negative impact, among other things, on the health of residents, and spatial order—including the quality of urban green

²⁰ A. Stolecka-Makowska: Triangulacja jako koncepcja pozyskania wiedzy o zachowaniach nabywczych konsumentów, *Studia Ekonomiczne Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach* 261/2016, p. 51-52.

²¹ Ibidem.

²² M. Ziolo: *Finanse zrównoważone...*, 2020, *op. cit.*, p. 14; M. Ziolo, B. Filipiak: *Finanse publiczne wobec ryzyka czynników niefinansowych (ESG)*. [in:] M. Ziolo (ed.) *Finanse. Finanse publiczne*, Polska Akademia Nauk, Warszawa 2021; A. Sobol (ed.): *Raport roboczy grupy eksperckiej Kongresu Polityki Miejskiej ds. Środowiska i adaptacji do zmian klimatu*, Obserwatorium Polityki Miejskiej IMiR, Kraków 2019, p. 7-26.

²³ These issues are regulated by: Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (*Journal of Laws of 2000*, No. 327, p. 1) and the *Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 14 października 2021 r. w sprawie ogłoszenia jednolitego tekstu ustawy – Prawo wodne*, *Dz.U.* 2021 poz. 2233, as amended.

²⁴ *Raport: Zarządzanie Zasobami Wodnymi w Polsce*, Global Compact Network Poland, Warszawa 2018.

²⁵ Ibidem.

areas, the condition of the facades of buildings, and the service life of the equipment used in industry and households.

Further challenges in the field of environmental risks relate to the implementation of the principles of the circular economy at the local level of government. It is one of the EU's political priorities and an important element of the European Green Deal. The tasks in the area of the municipal economy, which are included in local tasks, are of essential importance in this area²⁶. LGUs are responsible not only for providing important public services, but also as regulators of economic behavior, as well as investors in developing networks and devices. Moreover, the law allows for these tasks to be carried out in various ways, including in the form of local government budgetary establishments or using in-house public procurement and assignment of their performance to municipal companies²⁷. An important part of the circular economy is waste management, which should be recognized not only through the prism of reducing waste volume, but primarily by its recycling into the production cycle. Environmental risk can be linked to the need for local governments to comply with the standards established in the EU and national legislation. They assume, among others, that by 2035, a proportion of 65% of municipal waste must be recycled, while in Poland, it was only 26.9% in 2021²⁸. Another legal requirement imposed on local government units is the obligation of municipalities to establish at least one selective municipal waste collection point. Furthermore, the challenges of the circular economy include energy efficiency, which focuses not only on finding cost-effective energy solutions, but also on diversifying external suppliers and combating energy poverty. An important part is the sewage infrastructure, wastewater production, and management. The tasks of the local government units include, among other things, ensuring the maintenance of wastewater systems and wastewater treatment plants within the so-called "agglomerations" (designated by local authorities in agreement with the State Holding 'Polish Waters'). This can pose risks to local authorities, as Poland is characterized by a relatively low percentage (and regionally diversified) of the population connected to water and sewer installations. For example, in 2021, the proportion of residents using wastewater treatment plants in cities was 95%, compared to only 46% in villages. When discussing the environmental risk resulting from a circular economy, it is also necessary to emphasize the challenges related to the so-called "bioeconomy", which is in the area of Smart Specialization Strategies of many Polish regions.

²⁶ Art. 1, point 1, sec. 1 of the Ustawa z dnia 20 grudnia 1996 r. o gospodarce komunalnej, Dz.U. 1997 nr 9 poz. 43.

²⁷ A. Sobol (ed.): Raport roboczy grupy eksperckiej Kongresu Polityki Miejskiej ds. Środowiska i adaptacji do zmian klimatu, Obserwatorium Polityki Miejskiej IMiR, Kraków 2019, p. 7-26.

²⁸ Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain directives (Journal of Laws of the EU. No. 2008, No. 312, p. 3, as amended), art. 3b of the Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 13 maja 2022 r. w sprawie ogłoszenia jednolitego tekstu ustawy o utrzymaniu czystości i porządku w gminach, Dz.U. 2022 poz. 1297, as amended.

Table 1. ESG risk sources and its consequences for various spheres of activity of local government units

Sources of risk	Consequences for LGUs
Physical weather and hydrological events Natural resources (water, soil, air) Circular economy Low-carbon economy Sustainability reporting	<p style="text-align: center;">ENVIRONMENTAL RISK</p> <ul style="list-style-type: none"> - threat to the lives and health of inhabitants resulting from weather and hydrological events; - medical assistance to people affected by weather disasters, treatment of diseases caused by environmental pollution; - water deficit threatening to meet the needs of the population and the economy, poor water quality, low retention, lack of hydrotechnical structures regulating water flow; low renewal of water resources; - air pollution with emissions from the household and municipal sector, industry and transport: the negative impact of smog on the health and life of residents, the poor condition of urban green areas, poor water and soil quality, building facades or the lifetime of devices used in industry and households; increasing the carbon dioxide emission; requirements related to ensuring a certain share of electric vehicles in public transport (electromobility); - the need to guarantee sewage systems and wastewater treatment plants within the agglomeration, difficulties in sewing large areas with scattered development, problems related to the disposal of sewage sludge; - a high share of solid fuel stoves and boilers, low importance of cogeneration in district heating, poor energy and visual condition of many residential and public buildings; requirements for thermal modernization of buildings; - rising energy prices, problems with finding external suppliers, energy poverty, low share of energy from renewable sources, unmodernized street lighting systems; - growing requirements in the field of limiting the production of plastics and increasing their recycling and management of food waste, the need to replace traditional energy sources, the so-called "bioenergy": biofuels and biogas, space recycling; - difficult access to credits and loans and higher costs of servicing debts incurred for purposes that do not meet the criteria of the EU Taxonomy (e.g., investments in thermal waste treatment installations); potential increase in the costs of implementing public procurement due to the reduction in the number of contractors who meet the conditions specified in the EU Taxonomy; change in the current budget classification to 'green budgeting' (risk of improving budget indicators in order to gain access to external financing).
	<p style="text-align: center;">SOCIAL RISK</p> <ul style="list-style-type: none"> - in the case of depopulation and negative net migration, a decrease in the tax base; an increase in unit costs of providing many social services and maintenance of technical infrastructure, a decline in the quality of human capital, oversupply of construction sites; - the need to provide the elderly with long-term care, rehabilitation, care and assistance services, greater demand for health and social services for older residents and - in the case of a positive net migration - for the immigrant population, - the need to provide assistance to socially excluded people, social inclusion policy, increasing support for refugees; - problems with maintaining schools with a decreasing number of students in a situation of an influx of refugees - uncertainty and difficulties related to maintaining the quality and availability of care and educational services in the context of the increased number of children in schools; - deterioration of the quality of space due to suburbanization; - the need to organize support for the unemployed, possible threats related to competition on the labor market of residents and immigrants, which may result in difficulties in finding employment or lower wages; - preventing and combating crimes and social pathologies, - pressure on the development of municipal housing

GOVERNANCE RISK	
Management control, internal audit	– the obligation to ensure effective management control in the absence of uniform standards in this respect; – the need for a proper internal audit in view of its insufficient effectiveness;
Transparency and information	– ensuring high-quality information for residents (for properly assessing the degree of meeting their needs in relation to the taxes paid), entrepreneurs and capital donors (proper capital valuation), counteracting the 'Creative' budget accounting;
Quality of social capital	– implementation of a system for evaluating the quality of work of local government officials, their independence (civil service) and the degree of bureaucracy
Good governance	
Anti-corruption	– the need to ensure proportionate participation of women and men in the management of local government institutions;
Ensuring gender equality and wages	– reduction of the gender wage gap – reduce workplace rotation and implement procedures and activities to protect employees and prevent accidents and injuries in the workplace;
Occupational Health and Safety	– the need to monitor the risk of human rights violations and the implementation of ethical standards (ethical code);
Respecting human rights	– fighting against corruption (preventing and eradicating corruption, freeriding, moral hazard and tax evasion), implementation of a whistle-blower procedure allowing employees or third parties to report potential or actual cases of illegal behavior and established standards;
Sensitive data protection	– ensuring sensitive data protection (including personal data) against unauthorized access by third parties.

Source: own study.

Table 2. Instruments of sustainable public finance used to mitigate ESG risk in local government.

Type of risk	Instruments
Environmental	Eco-taxes (vehicle taxes, agriculture taxes, forestry taxes, real estate taxes) and eco-fees (local fees, municipal waste management fee; air pollution fees, product fees, trees and shrubs removal fees; license and maintenance fees; fees for exclusion of land from agricultural and forest production); administrative fines, other fines and tickets; funds from the National Fund for Environmental Protection and Water Management and the Regional Funds for Environmental Protection and Water Management (e.g., under programs such as: 'District Heating', 'Clean Air', 'Sokol', 'Energia Plus', 'Green Public Transport'), the Thermo-modernization and Renovation Fund ('Stop Smog' program for municipalities) and the Polish Deal Fund: Strategic Investment Program; foreign funds (Regional Operational Programs; Operational Program Infrastructure and Environment, Operational Program for Eastern Poland, Norwegian Financial Mechanism, EEA Financial Mechanism, Just Transition Fund, Streetlight project - EPC under the Intelligent Energy for Europe program; Budget expenditure on pro-ecological projects (thermo-modernization, energy efficiency, RES installations, electromobility, transport infrastructure), targeted grants for financing environmental investments by entities not belonging to the general government, subsidies to tariffs for municipal services; green public procurement; green bonds
Social	Benefits (permanent, periodic, specific), family benefits (family allowance, care allowance, nursing allowance, help for the birth of a child); financing non-cash benefits to reduce poverty and social inclusion; support for the unemployed, grants from State Fund for the Rehabilitation of the Disabled, and EU funds under the ESF financial tools targeted at families and the elderly; loans (e.g., for economic independence), socially sustainable public procurement, social bonds.
Governance	Performance budgeting, participatory budgeting, development of methods for multi-criteria evaluation of public programs and long-term financial planning, green practices in budget accounting and reporting, debt management policy and financial liquidity management, application of fiscal rules, ensuring transparency and accountability of public finances.

Source: own study.

Moreover, the environmental risk to local governments stems from the need to adapt to the rules of a low-emission economy, which has been defined in many EU and national regulations²⁹. This risk is related to the need to reduce greenhouse gas emissions (especially in transport, heating, agriculture, etc.), ensure energy efficiency (e.g., by implementing cost-effective solutions in the field of thermo-modernization of buildings and the installation of more energy-efficient devices), and use of renewable energy sources (RES). It should be noted that for the low-emission economy, an important problem is the implementation (by local governments) of the appropriate instruments and action plans (including heat, electricity, and gas fuel supply plans – and, in the case of investments in RES or energy efficiency, Low-Emission Economy Plans).

In the area of local public transport in Poland, environmental risks arise, among other things, from certain obligations imposed on LGUs to ensure a certain share of electric vehicles in the fleet of vehicles used, as well as in public transport³⁰. In addition, the environmental risk related to the withdrawal of coal can be particularly acute for the local governments where the companies operating in this industry are located. This will require measures to mitigate the social and economic impact of this process. The source of environmental risk for LGUs may also be the provisions contained in the EU Taxonomy³¹, which is a system of uniform classification of environmentally sustainable activities. It aims to redirect capital from environmentally harmful investments towards greener alternatives. Although this regulation does not impose direct obligations on local authorities in the field of environmental reporting (except for some municipal companies), the risk may be manifested by restricting access to external financing and EU funds for purposes that do not meet the taxonomy criteria. One cannot ignore the potential impact of these regulations on tenders and public procurement, as well as changes in the current budget classification towards green budgeting³².

The second category included in ESG is social risk (S). The crisis caused by the COVID-19 pandemic and the outbreak of war in Ukraine influenced the appreciation of social factors, which so far were more secondary to environmental issues. Social risks in LGUs are related to unfavorable demographic phenomena and problems arising from exclusion and social inequality. Demographic processes that pose challenges at local and regional levels include depopulation, adverse changes in the demographic structure, and migration. In the period from 2004-2020, depopulation (a decrease in the number of inhabitants) affected almost 60% of Polish municipalities³³. This can affect the size and structure of labor supply, the distribution of consumer demand, as well as the type of needs

²⁹ Such as: European Green Deal, European Climate Law, “Fit for 55” (and many others) and national regulations (Poland's Energy Policy until 2040 and the National Plan for Energy and Climate for 2021-2030).

³⁰ Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 7 kwietnia 2022 r. w sprawie ogłoszenia jednolitego tekstu ustawy o elektromobilności i paliwach alternatywnych, Dz.U. 2022 poz. 1083, as amended.

³¹ Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 establishing a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088, Journal Of EU, L 198, from June 22, 2020.

³² K. Wójtowicz: Wpływ Taksonomii UE na finanse JST w Polsce, Konferencja naukowa pt. Diagnoza stanu finansów samorządu terytorialnego – problemy, wyzwania, rekomendacje, Białystok 30.05.2022 r.

³³ P. Swianiewicz, J. Łukomska-Szarek: Zmiany demograficzne 2004-2020 Ranking, Wspólnota, 18.12.2021 r.

met by the services provided by LGUs³⁴. Another problem is the so-called “grey tsunami”³⁵. The Central Bureau of Statistics shows that from 2009-2020, the proportion of people over 65 in Poland increased from 13.5% to 18.6%, while the population dependency rate rose from 19% to 28.2% (the second-highest result in the EU)³⁶. Aging has many consequences for local governments, such as increasing social expenditure (for example, related to long-term care for the elderly) and healthcare spending. These expenditures are usually not covered by increased local budget revenues due to the worse financial situation of the elderly and their lower ability to pay taxes. On the other hand, the social risk to LGUs may also arise from the increasing proportion of people of pre-worker age in the population. A high proportion of pre-workers determines one of the most important categories of local expenditure (i.e., expenditure on education). Another source of social risk in LGUs is migration, both internally (e.g., from the countryside to the city, from large metropolitan areas to suburban areas) and externally (including the influx of refugees from war-torn Ukraine). In 2021, net internal migration in more than 2,000 (of almost 2,500) municipalities in Poland remained negative³⁷. At the same time, at the end of May 2022, almost 3.4 million Ukrainian refugees arrived in Poland, which already accounts for 8% of the country’s population. The influx of refugees has most affected urban areas where the proportion of the Ukrainian population is already, on average, 18%³⁸. The phenomenon of migration is a source of social risk, as it leads to changes in demand for public services, burdens on technical and social infrastructure, and sometimes also affects the spatial structure (e.g., as a result of suburbanization)³⁹. As part of social risk, one should also refer to challenges related to the broadly understood sphere of social exclusion (resulting from unemployment, homelessness, disability, addictions, etc.) and material poverty⁴⁰. Local governments affected by these phenomena are generally more vulnerable to financial problems. Furthermore, high concentrations of people with low social and material status in a particular area are often accompanied by high crime rates and other pathological behaviors. This results in an increase in local governments’ expenditures on social assistance or public safety, which are not compensated by increased tax revenues.

The last category that makes up the ESG risk is governance risk (G). It is linked to corporate governance, which enables the respect of the rights and interests of all stakeholders that form the local government community (residents, local authorities, government officials, investors or capital donors). Within this risk category, particular challenges

³⁴ J. Czempas: Struktury i procesy demograficzne jako determinanty decyzji podejmowanych przez samorządy terytorialne, *Finanse Komunalne* (1-2)/2015, p. 66-82.

³⁵ With this phrase, the well-known Polish demographer P. Szukalski defined the aging process of the society, whereby, while the real tsunami is retreating, ‘the grey tsunami creates a permanent pool’, P. Szukalski: *Starzenie się ludności – wyzwania dla polityki społecznej*, 2010, <http://slideplayer.pl/slide/434248> (access: 31.08.2022).

³⁶ Local Data Bank, Central Statistical Office, www.stat.gov.pl (access: 31.08.2022).

³⁷ *Ibidem*.

³⁸ M. Wojdant, P. Cywiński, P.: *Miejska gościnność: wielki wzrost, wyzwania i szanse, Raport o uchodźcach z Ukrainy w największych polskich miastach*. Centrum Analiz i Badań, Unia Metropolii Polskich im. Pawła Adamowicza, Warszawa 2022.

³⁹ K. Wójtowicz: *Uwarunkowania...*, 2019, *op. cit.*, p. 197.

⁴⁰ M. Kawa, W. Kuźniar: Skala zagrożenia ubóstwem i wykluczeniem społecznym, *Nierówności Społeczne a Wzrost Gospodarczy*, 51 (3)/2017, p. 330-335.

for LGUs are related to ensuring effective management control and internal audit⁴¹. Management control aims to reduce irregularities in the activities of local government and contribute to achieving its goals. Internal audit should focus on the evaluation of management control for its suitability, effectiveness, and efficiency. Unfortunately, the report from the Supreme Audit Office shows that in most of the controlled LGUs, the audit is conducted incorrectly and remains ineffective⁴². Some problems for a limited number of local governments can also be linked to the requirement to establish internal audit committees. In the context of management control, one should also mention the whistle-blower procedure⁴³, designed to allow municipal employees and other stakeholders (the whistle-blower) to report potential or actual unethical behavior or violations of the law. Governance risk can also result from a lack of transparency and access to information. Non-transparent behavior may lead to hiding the local public debt by using non-standard financial operations that are not included in the planned limits of incurred liabilities, as well as in budget reports. In extreme cases, this can lead to insolvency. In the context of the governance risk, it is necessary to mention the quality of local social capital, which consists of structural (groups, networks), normative-cognitive (social norms, value system), and behavioral (cooperation, cooperation, collective decisions) elements⁴⁴. The lack of social capital exposes local governments to corruption, moral risk, or tax avoidance. When discussing the governance risk, it is also important to emphasize the challenges faced by local authorities in connection with gender diversity policy, human resources policy (including the guarantee of equal pay for men and women and the limiting of the rotation of employment in local institutions), the guarantee of the respect of human and labor rights, and sensitive data protection.

The effects of ESG risk on the activity of local governments may be limited by appropriate fiscal policy instruments (sustainable public finances) (see Table 2). In the area of environmental risk mitigation, the main role is played by environmental policy instruments, such as environmental taxes and charges, as well as special purpose funds and foreign (including EU) financing. The environmental tax is an obligation fee on the subject of taxation that has a significant impact on the environment, which includes the following: vehicle tax, agricultural tax⁴⁵, forest tax⁴⁶, and property tax⁴⁷. The pro-ecological function of these taxes manifests itself in the possibility of distinguishing their amounts due to the magnitude of their impact on the environment (vehicle tax, property tax) or in direct relation to environmental resources (agricultural land, forests). The main instruments for reducing environmental risk are eco-fees. The 'garbage fee', which is fully allocated to cover the costs of the organization and operation of the municipal waste management system in municipalities, is very important. Other local ecological fees include air pollution fees,

⁴¹ Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 22 lipca 2022 r. w sprawie ogłoszenia jednolitego tekstu ustawy o finansach publicznych, Dz.U. 2022 poz. 1634, as amended.

⁴² Informacja o wynikach kontroli: Audyt wewnętrzny w jednostkach samorządu terytorialnego, LKI.430.007.2019, evidence number. 76/2019/P/19/074/LKI, NIK, Warszawa 2020.

⁴³ Directive (EU) 2019/1937 of the European Parliament and of the Council of 23 October 2019 on the protection of persons who report breaches of EU law (Journal of Laws of the EU, 2019, No. 305, p. 17, as amended).

⁴⁴ Z. Staniek Z.: *Ekonomia instytucjonalna. Dlaczego instytucje są ważne?*, Difin, Warszawa 2017, p. 47.

⁴⁵ Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 13 lutego 2020 r. w sprawie ogłoszenia jednolitego tekstu ustawy o podatku rolnym, Dz.U. 2020 poz. 333.

⁴⁶ Ustawa z dnia 30 października 2002 r. o podatku leśnym, Dz.U. 2002 nr 200 poz. 1682, as amended.

⁴⁷ Ustawa z dnia 12 stycznia 1991 r. o podatkach i opłatach lokalnych, Dz.U. 1991 nr 9 poz. 31, as amended.

product fees, trees and shrubs removal fees, license and maintenance fees⁴⁸, and fees for the exclusion of land from agricultural or forest production. As a profitable tool for reducing local environmental risks, financial incentives can also be shown to support law enforcement (penalties and administrative fines). Furthermore, an instrument for countering environmental risks is also earmarked funds that combine penalties or taxes with their allocation to environmental objectives. The LGUs in Poland use mainly the resources of the national (or regional) fund(s) for environmental protection and water management. The role of foreign sources of financing cannot be neglected, among other things: Regional Operational Programs, Operational Program Infrastructure and Environment, Operational Program for Eastern Poland, Norwegian Financial Mechanism, European Economic Area Financial Mechanism and Just Transition Fund. On the other hand, expenditure tools include direct budgetary expenditure for pro-ecological projects as well as targeted grants for financing or co-financing environmental investments carried out by the private sector (households, housing communities, entrepreneurs, as well as municipal legal entities). This category also includes tariff subsidies for certain services provided by municipal companies (for example, collective water supply and wastewater disposal). Innovative financial instruments can be included in green public procurement and green bonds, which were particularly important after the introduction of the EU Taxonomy.

Financial tools to reduce social risk in LGUs are mainly manifested in social policy instruments⁴⁹, including benefits (permanent, temporary, specific) and loans. This category also encompasses family and care allowances. In addition, local governments finance non-monetary aid aimed at poverty reduction (providing shelter or a meal) and social inclusion (crisis intervention and medical services). Instruments to mitigate environmental risks may include financial resources to support the unemployed and job seekers. An important source for financing the integration of people with disabilities is the National Fund for the Rehabilitation of Persons with Disabilities⁵⁰. Tools aimed at families and the elderly should also be mentioned. An increasingly popular instrument is the use of social clauses in determining criteria for public procurement or projects financed from European funds, particularly the European Social Fund. An innovative mechanism is social bonds in which local authorities borrow funds from existing markets to fund investments in social impact programs.

To limit the governance risk, local governments should use sustainable public finance instruments such as performance budgeting and participatory budgeting. Tools relating to the protection of fiscal discipline, including debt management and financial liquidity policies, the application of fiscal rules – as well as transparency and accountability mechanism – play a very important role.

⁴⁸ Articles 133 and 134 of the Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 7 kwietnia 2022 r. w sprawie ogłoszenia jednolitego tekstu ustawy - Prawo geologiczne i górnicze, Dz.U. 2022 poz. 1072, as amended.

⁴⁹ Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 17 listopada 2021 r. w sprawie ogłoszenia jednolitego tekstu ustawy o pomocy społecznej, Dz.U. 2021 poz. 2268, as amended

⁵⁰ Ustawa z dnia 27 sierpnia 1997 r. o rehabilitacji zawodowej i społecznej oraz zatrudnianiu osób niepełnosprawnych, Dz.U. 1997 nr 123 poz. 776, as amended.

Conclusion

Local governments operate under the risk of non-financial factors present in the main areas of their activity. The ESG risk has financial consequences for the actions conducted by the local government, which makes it necessary for local government units to consider this type of risk in the management process. At the same time, due to the multidimensional effects on the activity of economic entities and the strength and scope of impact, ESG risk is subject to numerous regulations, including those concerning the functioning of local government units. Therefore, the local government must implement solutions and guidelines relating to ESG determined by the applicable law. The paper is one of the first to discuss the impact of ESG factors on local government activities. The European Union has introduced several measures to reduce ESG risk; these measures are also associated with implementation obligations on the part of local government units (including in urban transport or waste management) and burdens on local government budgets. In the coming years, it is expected that domestic and international institutions, including European institutions, will intensify actions to reduce the risk of factors resulting from the adopted and binding strategic documents. These activities will also apply to local government units, which must find funds to carry out adaptation activities and develop comprehensive risk management systems for local government units and ESG reporting.

References

- Audyt wewnętrzny w jednostkach samorządu terytorialnego, LKI.430.007.2019, evidence number. 76/2019/P/19/074/LKI, NIK, Warszawa 2020.
- Czempas J.: Struktury i procesy demograficzne jako determinanty decyzji podejmowanych przez samorządy terytorialne, *Finanse Komunalne* (1–2)/2015, p. 66-82.
- Directive (EU) 2019/1937 of the European Parliament and of the Council of 23 October 2019 on the protection of persons who report breaches of EU law (*Journal of Laws of the EU*, 2019, No. 305, p. 17, as amended).
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (*Journal of Laws of 2000*, No. 327, p. 1).
- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain directives (*Journal of Laws of the EU*. No. 2008, No. 312, p. 3, as amended).
- European Climate Law, Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing a framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999.
- Friede G, Busch T, Bassen A.: ESG and financial performance: aggregated evidence from more than 2000 empirical studies, *Journal of Sustainable Finance & Investment*, 5, 4/2015, p. 210-233, <https://doi.org/10.1080/20430795.2015.1118917>
- The Global Risks Report 2022 17th Edition – INSIGHT REPORT, World Economic Forum, 2022, <https://www.weforum.org/reports/global-risks-report-2022/> (access: 05.04.2022).
- Hübel B, Scholz H.: Integrating Sustainability Risks in Asset Management: The Role of ESG Exposures and ESG Ratings, *Journal of Asset Management* 21 (1)/2020, p. 52-69, <http://dx.doi.org/10.2139/ssrn.3091666>
- I. Rackiewicz I. (ed.): *Niskoemisyjność i efektywność energetyczna. Raport o stanie polskich miast*, Instytut Rozwoju Miast, Kraków 2017.

- Jankiewicz S.: Gospodarka niskoemisyjna jako podstawa rozwoju regionu, *Nierówności Społeczne a Wzrost Gospodarczy*, 49, (1)/2017, p. 160-167.
- Kawa M., Kuźniar W.: Skala zagrożenia ubóstwem i wykluczeniem społecznym, *Nierówności Społeczne a Wzrost Gospodarczy*, 51 (3)/2017, p. 329-339.
- Klimek, M.: Funkcjonowanie jednostek samorządu terytorialnego podczas pandemii COVID-19, *Studia Politologiczne*, 64/2022, p. 89-108.
- Local Data Bank, Central Statistical Office, www.stat.gov.pl (access: 31.08.2022).
- Malinowska-Misiąg E.: Finanse jednostek samorządu terytorialnego w Polsce w pierwszym roku pandemii, *Optimum Economic Studies*, 107 (1)/2022, p. 48-63.
- Modernizacja energetyczna obiektów użyteczności publicznej w Płocku, <https://www.ppp.gov.pl/efektywnosc-energetyczna/> (access: 18.08.2022).
- Motowidlak U.: Rola transportu miejskiego w realizacji celów gospodarki niskoemisyjnej, *Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach*, 249/2015, p. 172-184.
- Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 13 lutego 2020 r. w sprawie ogłoszenia jednolitego tekstu ustawy o podatku rolnym, *Dz.U.* 2020 poz. 333.
- Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 13 maja 2022 r. w sprawie ogłoszenia jednolitego tekstu ustawy o utrzymaniu czystości i porządku w gminach, *Dz.U.* 2022 poz. 1297, as amended.
- Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 14 października 2021 r. w sprawie ogłoszenia jednolitego tekstu ustawy – Prawo wodne, *Dz.U.* 2021 poz. 2233, as amended.
- Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 17 listopada 2021 r. w sprawie ogłoszenia jednolitego tekstu ustawy o pomocy społecznej, *Dz.U.* 2021 poz. 2268, as amended.
- Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 22 lipca 2022 r. w sprawie ogłoszenia jednolitego tekstu ustawy o finansach publicznych, *Dz.U.* 2022 poz. 1634, as amended.
- Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 7 kwietnia 2022 r. w sprawie ogłoszenia jednolitego tekstu ustawy o elektromobilności i paliwach alternatywnych, *Dz.U.* 2022 poz. 1083, as amended.
- Obwieszczenie Marszałka Sejmu Rzeczypospolitej Polskiej z dnia 7 kwietnia 2022 r. w sprawie ogłoszenia jednolitego tekstu ustawy - Prawo geologiczne i górnicze, *Dz.U.* 2022 poz. 1072, as amended.
- Olech, D., Flak P. (2021). EBA pyta banki o praktykę zarządzania ryzykiem ESG i wskazuje kierunki, *Biuletyn Ryzyka*, 1, p. https://www.ey.com/pl_pl/biuletyn-ryzyka/eba-pyta-banki-o-praktyke-zarzadzania-ryzykiem-esg-i-wskazuje-kierunki (access: 18.08.2022).
- Pakiet „Fit for 55”. Jak wpłynie na samorzady? *Forum Ekonomiczne 2022*, <https://www.forum-ekonomiczne.pl/pakiet-fit-for-55-jak-wplynie-na-samorzady/> (accessed: 18.08.2022).
- Raport: zarządzanie zasobami wodnymi w Polsce, *Global Compact Network Poland*, Warszawa 2018.
- Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 establishing a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088, *Journal Of EU*, L 198, from June 22, 2020.
- Sobol A. (ed.): Raport roboczy grupy eksperckiej Kongresu Polityki Miejskiej ds. Środowiska i adaptacji do zmian klimatu, *Obserwatorium Polityki Miejskiej IMiR*, Kraków 2019.
- Staniek Z.: *Ekonomia instytucjonalna. Dlaczego instytucje są ważne?*, Difin, Warszawa 2017.
- Stolecka-Makowska A.: Triangulacja jako koncepcja pozyskania wiedzy o zachowaniach nabywczych konsumentów, *Studia Ekonomiczne Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach*, 261/2016, p. 50-61.

- Swianiewicz P., Łukomska J.: *Finanse samorządu terytorialnego w dobie pandemii*, Fundacja Bato-rego, Warszawa 2020.
- Swianiewicz P., Łukomska-Szarek J.: *Zmiany demograficzne 2004-2020 Ranking*, Wspólnota, 18.12.2021 r.
- Szukalski P.: *Starzenie się ludności – wyzwania dla polityki społecznej*, 2010, <http://slideplayer.pl/slide/434248> (access: 29.08.2022).
- Ustawa z dnia 12 stycznia 1991 r. o podatkach i opłatach lokalnych, Dz.U. 1991 nr 9 poz. 31.
- Ustawa z dnia 20 grudnia 1996 r. o gospodarce komunalnej, Dz.U. 1997 nr 9 poz. 43.
- Ustawa z dnia 27 sierpnia 1997 r. o rehabilitacji zawodowej i społecznej oraz zatrudnianiu osób niepełnosprawnych, Dz.U. 1997 nr 123 poz. 776, as amended.
- Ustawa z dnia 30 października 2002 r. o podatku leśnym, Dz.U. 2002 nr 200 poz. 1682, as amended.
- Ustawa z dnia 8 marca 1990 r. o samorządzie gminnym, Dz.U. 2022r. poz. 559, as amended.
- Wojdant M., Cywiński P.: *Miejska gościnność: wielki wzrost, wyzwania i szanse, Raport o uchodźcach z Ukrainy w największych polskich miastach*. Centrum Analiz i Badań, Unia Metropolii Polskich im. Pawła Adamowicza, Warszawa 2022.
- Wójtowicz K.: *Uwarunkowania i pomiar stabilności fiskalnej jednostek samorządu terytorialnego*, Wyd. UMCS, Lublin 2019.
- Wójtowicz K.: *Wpływ Taksonomii UE na finanse JST w Polsce*, Konferencja naukowa pt. *Diagnoza stanu finansów samorządu terytorialnego – problemy, wyzwania, rekomendacje*, Białystok 30.05.2022 r.
- Zioło M. (ed.): *Finanse. Finanse publiczne*, Polska Akademia Nauk, Warszawa 2020.
- Zioło M., Filipiak B.: *Finanse publiczne wobec ryzyka czynników niefinansowych (ESG)*, [in:] M. Zioło (ed.) *Finanse. Finanse publiczne*, Polska Akademia Nauk, Warszawa 2021.
- Zioło M.: *Finanse zrównoważone. Rozwój, ryzyko, rynek*, PWE, Warszawa 2020.
- Zu, L.: *Sustainability Risk Management*, [in:] S.O. Idowu, N. Capaldi, L. Zu, A.D. Gupta (eds), *Encyclopedia of Corporate Social Responsibility*, Springer, Berlin, Heidelberg 2013, https://doi.org/10.1007/978-3-642-28036-8_257

Polski samorząd terytorialny wobec wyzwań kreowanych przez ryzyko czynników niefinansowych (ESG)

Streszczenie

Celem artykułu jest usystematyzowanie stanu wiedzy na temat ryzyka czynników niefinansowych w polskim samorządzie terytorialnym. Ryzyko zmian klimatu, transformacji energetycznej, starzenia się społeczeństwa, czy ryzyko pandemiczne to tylko wybrane przykłady tego rodzaju ryzyka oddziałującego na jednostki samorządu terytorialnego (JST). W szczególności w artykule przedstawiono płaszczyzny i obszary usług publicznych realizowanych przez samorząd terytorialny najbardziej wrażliwe na działanie ryzyka ESG. Zwrócono uwagę na mechanizm dostosowawczy i działania podjęte przez samorząd terytorialny w Polsce mające redukować negatywny wpływ ryzyka ESG na aktywność JST i stabilność ich budżetów. Zaprezentowano kwestie wpływu regulacji unijnych odnoszące się do „niskoemisyjności” i mające wpływ na transport publiczny, przybliżono kwestie dotyczące działań na rzecz transformacji energetycznej, czy walki ze smogiem. W artykule wykorzystano krytyczną analizę literatury, metody porównawcze, obserwację, metody indukcji i dedukcji. Opracowanie jest jednym z pierwszych, które podejmuje dyskusję na temat roli i miejsca ryzyka czynników finansowych w działalności JST.

Słowa kluczowe: ryzyko, ESG, samorząd, usługi publiczne

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