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Demographic determinants of revenue autonomy in rural and urban-rural municipalities

Abstract

The aim of this paper is to identify demographic factors that influence revenue autonomy in the municipalities located in rural areas of the Warmian-Masurian Voivodeship in Poland. The first and the second sections contain a review of the literature analyzing the phenomena related to the economic aspects of revenue autonomy and its potential demographic determinants. The subsequent empirical section demonstrates that revenue autonomy of the municipalities was highly associated with two indicators of population ageing and net migration. These findings support the results of previous studies, as well as theory presented in the literature review.

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Introduction

Rural areas are undergoing various transformations and are characterized by high socio-economic diversity.¹ The literature on the subject emphasizes that some municipalities located in rural areas are beginning to resemble thriving cities and manifest similar levels of economic growth.² However, such observations are made in very few local administration units, mostly large urban agglomerations.

According to current studies on regional development, socio-economic phenomena that exert an adverse influence on the financial status of municipalities are more frequently encountered in municipalities with a prevalence of rural areas. Such phenomena include fiscal imbalance, excessive debt, and low financial autonomy.³ Rural municipalities generally have

1 A. Rosner, M. Stanny, *Monitoring rozwoju obszarów wiejskich. Etap II*, Fundacja Europejski Fundusz Rozwoju Wsi Polskiej, Instytut Rozwoju Wsi i Rolnictwa PAN, Warszawa 2016, pp. 57–60.

2 *Polska wieś 2016. Raport o stanie wsi*, red. J. Wilkin, I. Nurzyńska, Wydawnictwo Naukowe Scholar, Warszawa 2016.

3 P. Sánchez-Zamora, R. Gallardo-Cobos, F. Ceña-Delgado, *Rural areas face the economic crisis: Analyzing the determinants of successful territorial dynamics*, "Journal of Rural Studies" 2014, Vol. 35, pp. 21–25, <https://doi.org/10.1016/j.jrurstud.2014.03.007>.

limited financial resources, and the accumulation of socio-economic problems increases the demand for additional funding.⁴ Infrastructure investments, both new and reconstructive, are also undertaken less frequently in these municipalities.⁵ This, in turn, may deepen the existing problems and increase the disproportions between local government units. Local governments are faced with problems such as negative demographic changes, poverty and unemployment.⁶

Therefore, selected and detailed analyses investigating revenue autonomy – one of the aspects of financial management in rural municipalities – were used in the research. Revenue autonomy was discussed in the context of demographic changes which are one of the most pressing socio-economic problems in rural areas. Local administration units in Poland and in other countries around the world are facing problems brought on by depopulation, migratory movements and changes in the age structure of the population.⁷ The causes behind these changes have not been fully elucidated due to the complexity and the multidimensional nature of these phenomena.⁸ In the light of current global processes, the existing problems and their mutual associations should be addressed by research to establish a theoretical framework and formulate practical recommendations for local social and budgetary policies.

The aim of this study was to identify demographic factors affecting the revenue autonomy of municipalities in rural areas. According to some authors, areas that were characterized by the highest concentration of large state-owned farms in the Socialist era are particularly susceptible to the negative consequences of demographic changes in Poland. The adverse effects of collective farming and the subsequent privatization of state-owned farms are still being felt by local communities. The region of Warmia and Mazury (Masuria) is particularly noteworthy and unique because rural areas (i.e., areas located outside the administrative borders of cities) account for more than 97% of its total area.⁹ The selected voivodeship is also unique compared to other Polish regions, because more than 100 collective farms had operated in the rural

4 Y. Kim, M.E. Warner, *Geographies of Local Government Stress after Great Recession*, "Social Policy & Administration" 2017, Vol. 52, Issue 1, pp. 365–386, <https://doi.org/10.1111/spol.12307>.

5 X. Zhang, Y. Wu, M. Skitmore, S. Jiang, *Sustainable infrastructure projects in balancing urban–rural development: towards the goal of efficiency and equity*, "Journal of Cleaner Production" 2015, Vol. 107, pp. 445–454, <https://doi.org/10.1016/j.jclepro.2014.09.068>.

6 M.E. Warner, J.E. Pratt, *Spatial Diversity in Local Government Revenue Effort under Decentralization: A Neural-Network Approach*, "Environment and Planning C: Government and Policy" 2005, Vol. 23, Issue 5, pp. 657–677, <https://doi.org/10.1068/c16r>.

7 C. Martinez-Fernandez, N. Kubo, A. Noya, T. Weyman, *Demographic Change and Local Development: Shrinkage, Regeneration and Social Dynamics*, OECD Publishing, Paris 2012, <https://doi.org/10.1787/9789264180468-en>; A. Wichowska, *Shrinking municipalities and their budgetary revenues on the example of the Warmian-Masurian Voivodeship in Poland*, "Oeconomia Copernicana" 2019, Vol. 10, No. 3, pp. 419–432, <https://doi.org/10.24136/oc.2019.020>.

8 M. Bontje, S. Musterd, *Understanding Shrinkage in European Regions*, "Built Environment" 2012, Vol. 38, No. 2, <https://doi.org/10.2148/benv.38.2.153>; A. Wichowska, *Determinants of Debt in Rural Municipalities on the Example of the Warmińsko-Mazurskie Voivodeship*, "Acta Scientiarum Polonorum. Oeconomia" 2019, Vol. 18, No. 4, pp. 121–130, <https://doi.org/10.22630/ASPE.2019.18.4.52>.

9 *Diagnoza wybranych aspektów warunków życia środowisk popegeerowskich w województwie warmińsko-mazurskim*, Urząd Marszałkowski Województwa Warmińsko-Mazurskiego w Olsztynie, Olsztyn 2015.

municipalities of Warmia and Mazury. The result is, among others, that Warmia and Mazury is one of the least developed Polish regions. Rural and urban-rural municipalities in Warmia and Mazury (100 of the total number of 116 municipalities, where 99.05% of the area was rural) have been selected for this study precisely for this reason. Many of them have experienced adverse social and demographic changes in recent years.

The research hypothesis states that demographic factors, especially population ageing, exert a negative impact on the revenue autonomy of municipalities, which is a *sine qua non* prerequisite for self-governance and the proper functioning of administrative units at the lowest tier of administrative division.

It is generally believed that research on demographic problems in local units should have a time span of at least 5 years to reliably assess demographic changes.¹⁰ In this study, the research period covered the years 2014–2018. Factors that are potentially linked to the revenue autonomy of the analysed municipalities were selected in a multiple linear regression analysis. Gretl 2017d software was used to perform the calculations and verify the fulfilment of linear regression assumptions.¹¹

The revenue autonomy of municipalities in the economic context

The revenue autonomy of a local government is a less general concept than fiscal autonomy which also encompasses expenditure autonomy. Most studies on the revenue autonomy of Polish municipalities focus on the determinants, limitations and the theoretical context of revenue autonomy.¹² These studies have demonstrated that legal regulations and territorial organization are the key determinants of revenue autonomy. Two manifestations of autonomy can be identified in this context: a municipality can disburse financial resources independently or it can raise funds independently.¹³ Revenue autonomy can be regarded as a historical, political

10 M. Musiał-Malago, *Wybrane aspekty kurczenia się miast w Polsce*, "Studia Miejskie" 2018, Vol. 29, p. 62, <https://doi.org/10.25167/sm2018.029.04>.

11 T. Kufel, *Ekonometria. Rozwiązywanie problemów w wykorzystaniu programu GRETL*, Wydawnictwo Naukowe PWN, Warszawa 2011.

12 P. Galiński, *Samodzielność finansowa jednostek samorządu terytorialnego – pojęcie, determinanty, ocena*, <https://www.prawo.pl/samorząd/samodzielność-finansowa-jednostek-samorządu-terytorialnego-pojęcie-determinanty-ocena,79323.html> [accessed: 6 April 2021]; J. Heller, E. Farelńnik, *Finanse i samodzielność ekonomiczna a ustrój samorządów terytorialnych w Polsce*, "Studia Regionalne i Lokalne" 2013, No. 2(53), pp. 81–94, <https://doi.org/10.7366/1509499525205>; M. Poniatowicz, *Determinanty autonomii dochodowej samorządu terytorialnego w Polsce*, "Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu" 2015, No. 404, pp. 245–264, <https://doi.org/10.15611/pn.2015.404.17>; A. Wichowska, T. Wierzejski, *Revenue Autonomy and Entrepreneurship in the Municipalities of the Warmian-Masurian Voivodeship*, "Olsztyn Economic Journal" 2019, Vol. 14, No. 1, pp. 75–86, <https://doi.org/10.31648/oej.3647>.

13 D. Wyszowska, *Samodzielność dochodowa jednostek samorządu terytorialnego – Polska na tle wybranych krajów Unii Europejskiej*, "Annales Universitatis Mariae Curie-Skłodowska. Sectio H. Oeconomia" 2017, Vol. 51, No. 5, pp. 372–373, <https://doi.org/10.17951/h.2017.51.5.371>; R.I. Dziemianowicz, A. Kargol-Wasiluk, A. Bołtro-miuk, *Samodzielność finansowa gmin w Polsce w kontekście koncepcji good governance*, "Optimum. Economic Studies" 2018, No. 4(94), p. 209, <https://doi.org/10.15290/oes.2018.04.94.16>.

or legal issue in the former sense, or as an economic issue in the latter sense. In the economic sense, revenue autonomy is the ability to create streams of income and influence the structure and amount of income within the scope of the legal powers granted to municipalities.¹⁴

In order to exercise legally guaranteed revenue autonomy,¹⁵ municipalities have to generate sufficient incomes to fully perform their tasks and to regulate and administer taxes. Municipal revenues should rely not on state interference, but on the actions and decisions of the local government. It should be noted, however, that local governments are unable to fully finance all public tasks. The above implies that a significant portion of the national revenue has to be transferred from the central budget to local governments, which could compromise the state's ability to fulfil its basic economic functions and could exacerbate local disparities in access to public services. Such transfers would violate the principle of equal access to tax revenues.¹⁶ Nevertheless, by maximizing its own revenues, a municipality can increase its fiscal autonomy and its independence in policy-making, also in the long-term perspective.¹⁷

Greater revenue autonomy of local governments has positive implications for the entire national economy. According to foreign studies, there is a strong correlation between growing revenue autonomy at the local level and GDP growth per capita. Moreover, the efficacy of locally provided services increases in decentralized economies. It has been observed that larger state transfers to the local level generally compromise not only the efficacy of local services, but also the financial condition of local governments.¹⁸ State transfers (general and earmarked subsidies) should, therefore, serve only to stabilize the functioning of municipalities, especially in periods of economic downturn when local governments may not be able to fulfil their tasks and are forced to borrow funds from external sources.¹⁹

Revenue autonomy is a dynamic, not a static phenomenon. To some extent, local authorities can control their revenue autonomy by implementing dedicated policy instruments. Revenue autonomy can be limited by reducing local taxes and fees with the aim of, e.g., creating a more favorable environment for investment. Such measures could compromise a local government's ability to perform certain functions, and they can influence the residents' tax awareness (correlation between budgetary burdens and municipal objectives), which could lead to negative perceptions of the economic rationality behind the decentralization of public finances.²⁰

14 D. Wyszowska, *op. cit.*, p. 372.

15 Konstytucja Rzeczypospolitej Polskiej z dnia 2 kwietnia 1997 r. [The Constitution of the Republic of Poland of 2nd April, 1997] (Dz.U. nr 78, poz. 483, ze zm.); Europejska Karta Samorządu Lokalnego, sporządzona w Strasburgu dnia 15 października 1985 r. [European Charter of Local Self-Government] (Dz.U. 1994, nr 124, poz. 607).

16 *Raport o stanie samorządności w Polsce*, Małopolska Szkoła Administracji Publicznej, Kraków 2015.

17 K. Brzozowska, M. Gorzałczyńska-Koczkodaj, M. Kogut-Jaworowska, M. Ziolo, *Gospodarka finansowa w jednostkach samorządu terytorialnego*, Wydawnictwo CeDeWu, Warszawa 2014, p. 47.

18 C. Farvacque-Vitkovic, M. Kopanyi, *Municipal Finances: A Handbook for Local Governments*, Washington, DC: World Bank 2014, pp. 17–20.

19 *Raport o stanie samorządności w Polsce*, Małopolska Szkoła Administracji Publicznej, Kraków 2015.

20 M. Łyszkievicz, *Znaczenie samodzielności dochodowej*, "Gazeta Samorządu i Administracji" 2013, No. 7, pp. 19–20.

As an economic phenomenon, revenue autonomy of municipalities is regarded as mostly a microeconomic process because it refers to a specific local administrative unit or groups of units. From the economic perspective, the basic measure of revenue autonomy is the share of the municipality's own revenue in its total revenue. This indicator determines the extent to which a municipality's potential expenditure can be financed from local sources.²¹ Revenue autonomy can also be measured in a stricter sense by disregarding a municipality's share in central budget revenues derived from personal and corporate taxes in total revenues. The first approach was used in this study.

Demographic factors as a determinant of municipal budget revenues and revenue autonomy

Similarly to other organizations, municipalities operate in an external environment (macro-environment) and an internal environment (micro-environment).²² The macro-environment is independent of municipal activities, and it sets an objective background for the operations of all local government units in a given country. In turn, the micro-environment consists of elements which have a direct impact on local governance, but can also be shaped by the municipal authorities through various political and economic instruments. The micro-environment is primarily composed of the social layer (human resources), material resources (natural resources and infrastructure), as well as networks of relations and activities of an economic (entrepreneurship, labor market, institutions, finance), cultural and political nature.²³ From the budgetary point of view, these components constitute a municipality's economic resources,²⁴ which are also referred to as economic potential,²⁵ territorial resources or capital.²⁶ The analyses of factors that influence local budgeting processes and of the causes of financial problems in municipalities often make a reference to various categories of phenomena associated with the discussed resources. Several major groups of determinants are usually identified, such as economic, social (including demographic) and political factors.²⁷

21 J. Heller, E. Farelnik, *op. cit.*, pp. 82–83.

22 A. Adamik, M. Matejun, *Organizacja i jej miejsce w otoczeniu* [in:] *Podstawy zarządzania*, ed. A. Zakrzewska-Bielawska, Wolters Kluwer, Warszawa 2012, pp. 60–64.

23 J.J. Parysek, *Miasto w ujęciu systemowym*, "Ruch Prawniczy, Ekonomiczny i Socjologiczny" 2015, Vol. 77, No. 1, p. 34, <http://dx.doi.org/10.14746/rpeis.2015.77.1.3>.

24 M. Gwoździcka-Piotrowska, *Budżet gminy jako element zarządzania jednostką samorządu terytorialnego*, "Studia Ekonomiczne i Regionalne" 2012, Vol. 5, No. 2, pp. 104–105.

25 B.Z. Filipiak, *Podatkowe czynniki kształtujące potencjał finansowy jednostek samorządu terytorialnego*, "Finanse, Rynki Finansowe, Ubezpieczenia" 2016, No. 1(79), p. 644, <https://doi.org/10.18276/frfu.2016.79-51>.

26 P. Sánchez-Zamora, R. Gallardo-Cobos, F. Ceña-Delgado, *op. cit.*, p. 12.

27 M. Poniatowicz, *Wpływ kryzysu gospodarczego na systemy finansowe jednostek samorządu terytorialnego na przykładzie największych miast w Polsce*, Wydawnictwo CeDeWu, Warszawa 2014, pp. 56–57; L.G. Veiga, F.J. Veiga, *Determinants of Portuguese local governments' indebtedness*, "NIPE WP" 2014, No. 16, https://repositorium.sdum.uminho.pt/bitstream/1822/30612/1/NIPE_WP_16_2014.pdf [accessed: 9 April 2021]; D. Albalade, *The Institutional, Economic and Social Determinants of Local Government Transparency*, "Journal of Economic Policy Reform" 2013, Vol. 16, Issue 1, <https://doi.org/10.1080/17487870.2012.759422>, <http://diposit.ub.edu/dspace/bitstre>

This research focuses on the demographic factors that directly influence the financial condition of municipalities,²⁸ in particular their economic productivity (employment), local taxes and fees, which are crucial for the revenue autonomy of municipalities. It tends to improve with local population growth.²⁹ This relationship is primarily due to the greater mobility of residents with higher entrepreneurial skills. Additionally, it is the result of the rationality of profit-oriented activity, which is lower in areas with decreasing population. In such cases, the area for conducting business activity also decreases, which generates lower budget revenues from property tax. Income from tax on means of transport, civil law transactions and stamp duties is also lower. In the case of agricultural areas, the share of municipalities in income taxes decreases as well. All this reduces the income independence of these municipalities.³⁰

In reference to the above, in this study, the following parameters have been taken into account to identify the demographic factors that influence revenue autonomy in the rural municipalities of the region of Warmia and Mazury: change in population per 1000 inhabitants (X_1); feminization rate (X_2); marriages per 1000 population (X_3); population density – persons per 1 km² (X_4); proportion of pre-working-age population in total population (X_5); proportion of working-age population in total population (X_6); proportion of post-productive population in total population (X_7); non-productive population per 100 working-age population (X_8); post-working age population per 100 pre-working-age population (X_9); post-productive population per 100 working-age population (X_{10}); old-age dependency ratio (X_{11}); proportion of population aged 65 and over in total population (X_{12}); net internal migration per 1000 population (X_{13}); net foreign migration per 1000 population (X_{14}); live births per 1000 population (X_{15}); deaths per 1000 population (X_{16}); birth rate per 1000 population (X_{17}).

These parameters were used as potential demographic independent variables for revenue autonomy dependent variable. The choice of the above parameters was dictated by the availability of data in the Local Data Bank of Statistics Poland³¹ and the referenced literature.

Demographic determinants of revenue autonomy of rural and urban-rural municipalities in the region of Warmia and Mazury

Linear regression analysis was used in this study to identify statistically significant determinants of revenue autonomy. In economic studies, linear regression analysis involves the construc-

am/2445/58408/1/IR12-010_Albalate.pdf, pp. 10–12; M. Bisogno, B. Cuadrado-Ballesteros, I.M. García-Sánchez, *Financial Sustainability in Local Governments: Definition, Measurement and Determinants*, "Financial Sustainability in Public Administration", Palgrave Macmillan, Cham 2017, p. 68, https://doi.org/10.1007/978-3-319-57962-7_3.

28 H. Mäding, *Demographic Change and Local Government Finance – Trends and Expectations*, "German Journal of Urban Studies" 2004, Vol. 43, No. 1, pp. 1–15.

29 M. Arzaghi, J.V. Henderson, *Why countries are fiscally decentralizing*, "Journal of Public Economics" 2005, Vol. 89, Issue 7, pp. 1183–1184, <https://doi.org/10.1016/j.jpubeco.2003.10.009>.

30 A. Miszczuk, M. Miszczuk, *Zmiany zaludnienia jako czynnik redystrybucji dochodów gmin (na przykładzie województwa lubelskiego)*, "Roczniki Nauk Społecznych" 2017, Vol. 9(45), No. 1, p. 73, <https://doi.org/10.18290/rns.2017.9.1-4>.

31 Local Data Bank of Statistics Poland, <https://bdl.stat.gov.pl/BDL/> [accessed: 6 June 2020].

tion of an econometric model, estimation of the modeled parameters, and verification of the assumptions relating to the model and its stochastic character.³² In this study, the revenue autonomy indicator was used as the dependent variable, and demographic parameters were the potential independent variables.

Three of the 17 potential demographic variables were significantly correlated with the revenue autonomy indicator calculated for the rural municipalities of the region of Warmia and Mazury in 2014–2018:

- old-age dependency ratio (X_{11}),
- net internal migration per 1000 population (X_{13}),
- proportion of post-productive population in total population (X_7).

The calculated values of the coefficient of determination R^2 indicate that variation in the above factors explained nearly 57% of the variance in the revenue autonomy indicator. Other parameters which, given the scope of the study, were not taken into account, explained nearly 40% of the variance in the revenue autonomy indicator

The regression equation can be written as follows (where e denotes regression residuals):

$$Y = 44,34 - 2,25X_{11} + 0,85X_{13} + 0,43X_7 + e$$

The estimated regression equation fulfils the assumptions for statistical inference on the relationship between the modeled variables. The results of the multiple linear regression analysis are presented in Table 1. The results of basic statistical tests confirming the validity of the estimation and statistical inference on the regression model are also presented in Table 1.³³

An analysis of the results (parameters of the above equation) indicates that the share of own revenue in total revenue (revenue autonomy indicator) in the investigated municipalities:

- would decrease by 2.25 percentage points on average if the old-age dependency ratio (ratio of the post-productive population to the working-age population) were to increase by 1 percentage point on average (*ceteris paribus*);
- would increase by 0.85 percentage point on average if net migration per 1000 population were to increase by 1 person on average (*ceteris paribus*);
- would increase by 0.43 percentage point on average if the proportion the post-productive population in total population were to increase by 1 percentage point on average (*ceteris paribus*).

These results suggest that population ageing and internal migration were the key demographic determinants of revenue autonomy in the studied municipalities. These conclusions elaborate on the previous observations made by Mirosław Gornowicz and Anna Wichowska,³⁴ who found a strong correlation between similar demographic factors and the budgetary revenues of all municipalities in the region of Warmia and Mazury. Therefore, it can be concluded that similar factors exert a similar and strong influence on revenue autonomy.

32 *Ekonometria*, red. M. Gruszczyński, M. Podgórska, Oficyna Wydawnicza SGH, Warszawa 2004, p. 12.

33 T. Kufel, *op. cit.*

34 M. Gornowicz, A. Wichowska, *Struktura demograficzna a dochody gmin województwa warmińsko-mazurskiego w latach 2010–2014*, "Społeczeństwo i Ekonomia" 2017, No. 1(7), p. 71, <https://doi.org/10.15611/sie.2017.1.05>.

It should also be noted that the revenue autonomy indicator was most strongly correlated with the old-age dependency ratio. Revenue autonomy tended to be lower in rural municipalities with a higher ratio of the elderly population to the working-age population. One of the limitations of regression analysis is that a cause-effect relationship cannot be directly inferred from the studied parameters; nonetheless, the observed relationship indicates that population ageing poses a significant problem in the studied municipalities. This observation is also supported by variable (X_7) which reflects the proportion of the post-productive population in total population. In this study, variable (X_7) was bound by a somewhat weaker correlation with the revenue autonomy indicator.

Table 1. The results of the linear regression analysis of the revenue autonomy indicator dependent variable and demographic factors independent variables in the rural municipalities of the region of Warmia and Mazury in 2014–2018

Assessment criteria / independent variables	X_{11}	X_{13}	X_7
Coefficient of regression	-2.25	0.85	0.43
P-value in Student's t-test	2.47e – 5***	8.68e – 13***	2.70e – 7***
Indicator of collinearity – VIF	1.47	1.38	1.58
Combined significance of parameters	F(3, 96) = 42.12 with p-value p = 1.85e – 17		
Normal distribution of the random component – Doornik-Hansen test	Chi-square(2) = 2.56 with p-value p = 0.28		
Homogeneity of residual variance – White's test	LM = 7.81 with p-value p = P(Chi-square (9) > 7.81) = 0.55		
Autocorrelation – Durbin-Watson test	DW = 1.95 with p = 0.38 dL = 1.64; dU = 1.75		
Coefficient of determination R ²	56.83%		

Source: own study based on data from: Local Data Bank of Statistics Poland, <https://bdl.stat.gov.pl/BDL/> [accessed: 6 June 2020].

Internal migration expressed by net migration per 1000 population was also an important determinant of revenue autonomy in the studied rural municipalities. Negative net migration poses one of the most serious problems in Warmia and Mazury, and it can be largely attributed by the economic and social problems faced by the analysed region. According to Statistics Poland, in 2014–2018, net internal migration per 1000 population was negative in rural and urban-rural municipalities of the studied region at –3.6 on average. The local inhabitants migrated mostly to cities (around 65% on average) in search of employment, self-development and education opportunities.

Conclusions

Self-governance at the local level requires considerable independence from central state structures. Revenue autonomy is an important manifestation of self-governance, and it allows local governments to perform basic statutory tasks without central government interference. A decentralized administrative system ensures more efficient allocation of public resources, and it can influence the overall condition of the national economy.

The revenue autonomy of municipalities is influenced primarily by the national legal system, but potential determinants of budgetary revenue also play an indirect role. These determinants include social factors, specifically those related to current demographic changes. Adverse demographic changes affect mostly rural areas in Poland. Many rural municipalities attract new residents from urban areas, whereas others bear the brunt of the negative consequences of internal migration.

The most important demographic determinants of revenue autonomy were identified by analyzing the revenue autonomy of rural municipalities in conjunction with demographic changes. The observations made in the rural and urban-rural municipalities of the region of Warmia and Mazury validate other authors' findings on the adverse consequences of demographic problems. Population ageing and internal migration which depletes the rural population have been identified as the key obstacles to the revenue autonomy of rural municipalities not only in the studied region, but also in municipalities with a similar socio-economic status.

The regression model constructed in these studies may be further used in economic forecasting or simulations of the response of the dependent variable to changes in the values of the independent variables. This model can be used to design further activities of municipalities in the long-term counteracting demographic problems in the context of improving their financial situation and revenue autonomy. Rural and urban-rural municipalities can initiate various statutory measures in the area of health, welfare, education, housing, land reclamation and promotional activities to counteract demographic problems. These tasks should be implemented to improve the quality of life of the elderly and the unemployed, to combat poverty through family-oriented policies, and to create new opportunities for young people through equal access to education, training and improvements in housing conditions. To curb rural-urban migration and local population decline, the municipalities should also rely on the existing instruments to promote sustainable use of natural resources and stimulate entrepreneurship, including ecotourism, agritourism and organic farming, also with the support of the EU funds.

These measures require significant funding as well as sound decision-making at the local level. Active steps are required to minimize or avert the negative consequences of demographic processes on municipal finances and, above all, local community members who are the direct beneficiaries of budgetary resources.

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