



Original article

# Population changes in former voivodeship cities in Poland in the context of suburbanization processes and loss of the administrative function

Wioletta Szymańska<sup>1</sup>, Tomasz Michalski<sup>\*2</sup>
<sup>1</sup>*Institute of Geography and Regional Studies, Faculty of Mathematics and Natural Sciences, Pomeranian University in Słupsk, 22a Arciszewskiego Str., 76-200 Słupsk, Poland*
<sup>2</sup>*Department of Regional Development Geography, Faculty of Oceanography and Geography, University of Gdańsk, 4 Bażyńskiego Str., 80-309 Gdańsk, Poland*

E-mail address (\*corresponding author): tomasz.michalski@ug.edu.pl

ORCID iD: Wioletta Szymańska: <https://orcid.org/0000-0001-8673-2074>; Tomasz Michalski: <https://orcid.org/0000-0002-7916-9620>

## ABSTRACT

The article presents an attempt to analyse population changes and to measure the strength of the impact of factors causing these changes in former voivodeship (province) cities in Poland. In view of the ongoing processes of suburbanisation, the discussion also concerns the areas surrounding the city, i.e. those creating urban systems together with the city. These zones were delineated, calling them demographic influence zones, because only demographic factors were involved in defining them. The research was conducted in the period between 1999–2015, and took into account the administrative reform of the country that degraded 31 cities from voivodeship (NUTS-2) capitals to powiat (LAU-1) cities. The main aim of the study was to find an answer to the question: do the directions and the strength of population changes confirm a hypothesis of the destructive impact of the loss of administrative function on settlement units. The results of the study only partially confirmed this hypothesis. Although a decrease in the population is overwhelmingly predominant in the city core, in the case of the demographic influence zone, it has already increased. Counting both parts together, it was found that in half of the cases there was a decline and in the other half a growth of the population.

KEY WORDS: demography, city, suburbanisation, administrative function, Poland

ARTICLE HISTORY: received 10 May 2019; received in revised form 23 July 2019; accepted 13 August 2019

## 1. Introduction

Today in Poland there is an inverted trend in population development in the context of city – village. For many years, the development of towns has been greater than rural development. It was only at the end of the 20<sup>th</sup> century that the trend was reversed (KANTOR-PIETRAGA, 2014a, 2015; ZBOROWSKI ET AL., 2012), and now many Polish cities are affected by the process of depopulation. This is partly related to the second demographic transition occurring in Poland (KUREK, 2011; WALFORD & KUREK, 2016). However, the processes of systemic transformation which resulted in major changes

in the factors of their development are also an important impulse for demographic changes in Polish cities (WĘCŁAWOWICZ, 2016; PARYSEK, 2004). From the viewpoint of city size, it seems that the large and smallest towns have been the most affected by the depopulation process in Poland (DŁUGOSZ & BIAŁY, 2015; KAMIŃSKA & MULARCZYK, 2014; CZARNECKI, 2011), and middle-size towns to a lesser extent (PANECKA-NIEPSUJ, 2013; RUNGE, 2011, 2016). In contrast, from the viewpoint of city function, it seems that post-industrial cities have been the most affected (DŁUGOSZ, 2017; LAMPRECHT, 2013; SPÓRNA & KURPANIK, 2013; RUNGE, 2008; KRZYSZTOFIK & SZMYTKIE, 2018). Obviously,

Poland is not an exception among European post-communist countries. The demographic changes presented here are also observed in other countries of the region (ANTIPOVA & TITOV, 2016; BERNT ET AL., 2014; MARSZAŁEK, 2017; MYKHENKO ET AL., 2010; SMĘTOWSKI, 2018; ŠPROCHA ET AL., 2017), and their driving force also comes from the processes associated with the second demographic transition (LESTHAEGHE, 2011; SOBOTKA, 2008; WILSON, 2013) and systemic transformation (KOLLMORGEN, 2013; MOLE, 2012; NORKUS, 2012; ROAF ET AL., 2014) and, in some countries, they are also derived from former (BOJKOV, 2003; DELANEY ET AL., 2017) or current armed conflicts (KATCHANOVSKI, 2016; KOLOSOV, 2018).

Placing the administrative function in a catalogue of reasons for functional development or degradation of cities is not easy. The mere perception of the administrative function is related to many scientific disciplines and to a diversity of approaches. In geographic studies, administrative functions have been included in theoretical considerations in different concepts of urban development. It should be stressed, however, that they have never been analysed in terms of their independent impact on the structure, potential or demographic changes of settlement units. The theory of economic base indicates the indirect significance of the administrative function in the development or degradation of cities (BUDNER, 1999; DZIEWOŃSKI, 1967, 1972; WALKIEWICZ, 2006). Studies on this problem indicate that the representation of the issue of the administrative function in the research programme of the functional analysis of cities takes too little space and does not fully explain the role it plays (BERRY & HORTON, 1970; HUDSON, 1970; KACZMAREK, 1996; NELSON, 1955, PUMAIN & SAINT-JULIEN, 1978). The theory of central places provides a slightly clearer indication of the significance of the administrative function (DZIEWOŃSKI, 1972; MAIK, 1997; SULIBORSKI, 2010), but a need for a separate identification of the notion of central functions and administrative functions should be clearly emphasised (LISZEWSKI, 1992). Too much importance assigned to the administrative function in this theory is explained by its essence (CHABOT & BEAUJE-GARNIER, 1971), which has too limited a scope to become the basis of urban functions, especially at the lower levels of territorial administration. The question of considering the administrative functions holistically is presented by the concept of dualism of settlement phenomena and the multi-level concept of space function (MAIK, 1988, 1992) or the resilience theory (WILSON, 2012). Both the former and the latter point to the need for a

cause and effect interpretation in a broad socio-environmental context. Nevertheless, to understand the relevance and to interpret theoretical links between the selected phenomena, it is desirable to conduct studies identifying them in a direct way. The institutional organization of the town (SZAJNOWSKA-WYSOCKA, 1993, 1995), the function of the space (SULIBORSKI, 2001; 2003), the concept of regional governments and a territorial social system (CHOJNICKI, 1999), or the concept of urban regime (SAGAN, 2000) all refer to this.

In this context, the former voivodeship (NUTS-2) cities in Poland should not be seen as being specifically affected by the degradation process due to their average size, measured by size of the population. However, there is a widespread belief that the loss of the administrative function is a factor conducive to destructive processes, including increased depopulation (WENDT, 2001; KOMOROWSKI, 2012). However, there are more and more opinions that the loss of the administrative function does not have to mean city degradation (KURNIOWICZ & SWIANIEWICZ, 2016; SZYMAŃSKA, 2015). In the economic development perspective, objective indicators do not seem to confirm the negative impact of the loss of administrative functions (SOKOŁOWSKI, 2011; WILK, 2004). This issue is somewhat differently viewed in terms of social development and social perception (KRYSIŃSKI, 2013; SPRINGER, 2016). Therefore, a question arises as to whether the population changes in the former voivodeship cities analysed in the context of suburbanisation processes causing their degradation and whether this is related to the loss of administrative function. Here one can put forward an idea that if the loss of the administrative function plays a key role in the demographic development of cities, all former voivodeship cities together with their demographic influence zones should suffer the negative effects of this situation.

The subject of this article is to show both the magnitude of population changes and to indicate the strength of factors causing these changes in the former voivodeship cities in the context of settlement processes, especially suburbanisation. With this in mind, all analyses will be conducted in three spatial dimensions, taking into account the city within its administrative boundaries (city core: CC), its suburban area, defined as the demographic influence zone (DIZ) and the urban system (US = CC + DIZ). Taking into account the processes of suburbanisation occurring in Poland (LITYŃSKI & HOŁUJ, 2017; PARYSEK, 2008; RUNGE & KŁOSOWSKI, 2011; SPÓRNA, 2018), only such an approach provides a holistic analysis of

demographic changes in the former voivodeship cities.

The temporal scope covers the 15 years that have elapsed since the last administrative reform of Poland. This will allow an assessment of whether loss of the administrative function has had a destructive effect on the population of former voivodeship cities. In this context, the main aims of the article are to answer the questions:

- What direction did population changes take in the former voivodeship cities treated as cities within administrative boundaries and as an urban system with an external zone (DIZ)?
- What is the strength of the influence of particular factors of demographic development on population changes in these cities, their external zones and the entire systems?
- Is there a confirmation of the negative impact of the loss of the administrative function on demographic development?

## 2. Data sources and methods of analysis

The data used in the study comes entirely from the official data provided by Statistics Poland (<https://stat.gov.pl/en/>), more precisely from its two databases: **LOCAL DATA BANK AND BAZA DEMOGRAFIA** (available only in Polish). While conducting research based on official data presented by Statistics Poland, it should be noted that they represent an excessively optimistic picture of the demographic situation owing to inappropriate migration formulas that are not included in the official statistics (cf. **DRBOHLAV**, 2012; **OKÓLSKI**, 2018). Similarly, changes in the administrative boundaries of cities and partly undeclared internal migrations exert a distorting effect, mainly resulting in the underestimation of the population of attractive agglomerations and suburban areas and, at the same time, overestimating peripheral areas (cf. **KANTOR-PIETRAGA**, 2014B; **PARYSEK & MIERZEJEWSKA**, 2009; **ŚLESZYŃSKI**, 2016).

Several methods and techniques have been used in the study to achieve the pursued aims. Firstly, delimitation of demographic influence zones (DIZ) was made for the former voivodeship cities. Many methods are used to determine the extent of a suburban area (cf. **FALKOWSKI**, 2009; **STASZEWSKA**, 2013; **ŚLESZYŃSKI**, 2013). The methodology adopted by **ŚLESZYŃSKI** (2013) and used to define the so-called urban functional areas (UFA) was applied (cf. **ILNICKI & MICHALSKI**, 2015; **BARTOSIEWICZ**, 2015). Based on **SULIBORSKI'S** guidelines (1985), namely that the extent of a suburban area is determined

by the examined function and objectives it is supposed to serve, the number of indicators used to delineate this has been reduced to two:

- F1 – the number of people leaving for hired labour to the core of UFA per 1,000 working age (women: 18-59 years, men: 18-64 years) of the population of the given gmina (LAU-2) (2011<sup>1</sup>) – the recommended value above 50.00;
- F2 – the number of registrations from the core of UFA per 1,000 inhabitants of the gmina (2015) – the recommended value above 3.00.

In the adopted method of classifying individual gminas into DIZ, the methodology of weighting was applied to give both indicators weights according to the recommended value for the indicator (**SZYMAŃSKA**, 2018): the indicator value of 100% – 5 points, 75–99% – 4 points, 50–74% – 3 points, 25–49% – 2 points, less than 25% – 1 point. Next, the mean value of the weights for both indicators was calculated (the range is between 0–5). Gminas with a value of the indicator weights within the range of 4–5 were included in the demographic influence zone, recognising them as being strongly related in terms of both commuting to work and settling down. The condition of meeting the spatial continuity of the DIZ was considered important; therefore,

- in the case of urban-rural gminas, if at least one of its parts, i.e. the urban or the rural area, reached the required level of the indicators, the whole area of the gmina was included in the zone;
- a gmina that did not reach the required indicator value but was surrounded by gminas included in the zone was also included into the DIZ.

However, it should be clearly stressed that one must not identify such delineated DIZs with other perspectives of peri-urban areas, such as rural-urban fringe, areas covered by urban sprawl, suburbia, etc. because these emphasise other aspects of peri-urban areas (see: **COUCH ET AL.**, 2007; **HARASIMOWICZ**, 2018; **LITYŃSKI**, 2015; **SULLIVAN & LOVELL**, 2006).

In total, for 31 former voivodeship cities 220 gminas were included in the zones, including 8 urban gminas, 35 urban-rural gminas and 177 rural gminas. The results are presented in Fig. 1.

Designation of the DIZ allowed conducting detailed demographic analyses in three spatial dimensions:

- City core (CC) – an area within the administrative borders of the former voivodeship city;

---

<sup>1</sup> The adopted temporal scope is due to the availability of statistical databases.

- Demographic influence zone (DIZ) – an external zone designated by indicators F1 and F2;
- Urban system (US) – the total area of CC and DIZ.

The calculation of the balance of population changes and the dynamics of these changes in all dimensions was based on formulae according to which the balance of population changes means the difference between the final and the initial population numbers. The dynamics of these changes is a fixed base index of dynamics, which gives the percentage change in the level of a phenomenon in the final period relative to the initial period (cf. TIMOFIEJUK ET AL., 2003).

Next, three factors causing the population change were analysed: the balance of the administrative changes, the rate of natural increase and the net migration rate. The analyses related both to the value level of the factor concerned at a given time and to the strength of its impact on the population change.

The balance of administrative changes concerned the changes in the borders between gminas which were made since the last territorial reform of Poland, i.e. from 01 Jan. 1999 to 31 Dec. 2015. The study identified a change in the area and the accompanying population changes (cf. SZMYTKIE & KRZYSZTOFIK, 2019).

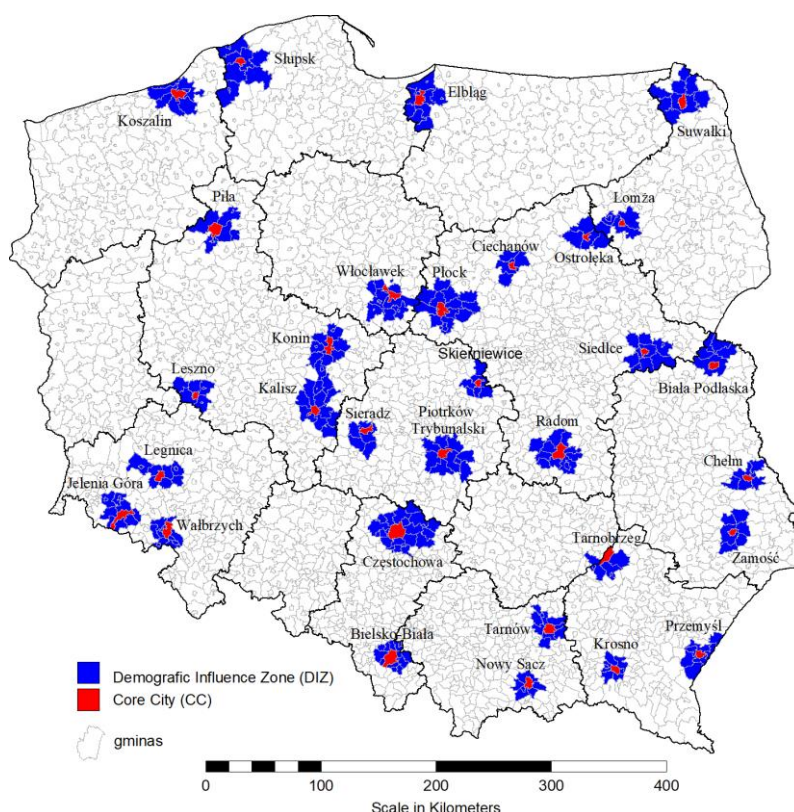


Fig. 1. Demographic Influence Zone (DIZ) of the former voivodeship cities in 2015 (Source: Own studies based on Local Data Bank and Baza Demografia)

Webb's typology (cf. RUNGE, 2007) was applied to determine the significance of natural increase and the migration rate. There are 8 demographic types:

- A – positive natural increase exceeds negative migration balance,
- B – positive natural increase exceeds positive migration balance,
- C – positive migration balance exceeds positive natural increase,
- D – positive migration balance exceeds negative natural increase,
- E – negative natural increase exceeds positive migration balance,

- F – negative natural increase exceeds negative migration balance,
- G – negative migration balance exceeds negative natural increase,
- H – negative migration balance exceeds positive natural increase.

Demographic types were determined as an average of the whole research period (1999–2015), which means that Webb's typology was calculated from the total natural increase and the net migration rate in absolute values for all the years analysed.

In the final stage, the strength of the impact of individual factors on population changes was determined. To calculate it, a structure indicator



formula was used, which was calculated from the absolute values of the administrative change balance, the rate of natural increase and the net migration rate from 1999 to 2015, according to the formula:

$$I_{st} \frac{n_i}{\sum_i |n_i|}$$

where:

$I_{st}$  – structure indicator;

$n_i$  – the number (frequency) of the specified  $i$ -value of the variant of the feature.

After calculating the strength (in %) of individual factors, they were assigned an appropriate symbol of the direction of changes ("+" the factor causes population growth or "-" the factor causes population loss).

### 3. The balance of population changes in urban systems of former voivodeship cities

Analysis of the population balance during the examined period in terms of absolute values and the relative rate of change is the basic element in defining population changes (Table 1). In this respect, almost all former voivodeship cities (CC) recorded a population loss. There was a relatively stable balance in only five of them – Leszno, Nowy Sącz, Siedlce, Skierniewice and Suwałki. This decidedly negative picture of depopulation is in line with the depopulation trends in Polish cities (MUSIAŁ-MALAGO, 2016; WĘCŁAWOWICZ ET AL. 2006).

Table 1. Population changes in urban systems of the former voivodeship cities in 1999–2015  
(Source: Own studies based on Local Data Bank and Baza Demografia)

No.	Former voivodeship city	Growth/loss [in persons]			Dynamics [year 1999=100]		
		CC	DIZ	US	CC	DIZ	US
1	Biała Podlaska	-128	1 382	1 254	99.8	104.7	101.4
2	Bielsko-Biała	-6 345	18 598	12 253	96.5	111.7	103.6
3	Chełm	-4 693	1 355	-3 338	93.2	104.8	96.6
4	Ciechanów	-2 039	1 279	-760	95.6	106.1	98.9
5	Częstochowa	-25 892	4 528	-21 364	89.8	102.7	94.9
6	Elbląg	-6 517	1 615	-4 902	94.9	104.8	97.0
7	Jelenia Góra	-9 563	2 319	-7 244	89.4	104.6	94.8
8	Kalisz	-5 775	2 974	-2 801	94.7	103.2	98.6
9	Konin	-6 710	9 219	2 509	91.9	112.4	101.6
10	Koszalin	-1 971	4 687	2 716	98.2	110.9	101.8
11	Krosno	-2 061	2 519	458	95.8	105.0	100.5
12	Legnica	-6 621	1 899	-4 722	93.8	103.6	97.1
13	Leszno	1 715	6 675	8 390	102.7	118.6	108.5
14	Łomża	-871	1 824	953	98.6	106.5	101.0
15	Nowy Sącz	4	12 556	12 560	100.0	117.9	108.2
16	Ostrołęka	-1 437	5 205	3 768	97.3	117.4	104.5
17	Piła	-861	2 738	1 877	98.9	108.4	101.7
18	Piotrków Trybunalski	-6 456	1 451	-5 005	92.1	101.9	96.8
19	Płock	-6 923	7 883	960	94.6	109.3	100.5
20	Przemyśl	-5 838	3 258	-2 580	91.5	107.9	97.7
21	Radom	-14 545	13 140	-1 405	93.7	114.6	99.6
22	Siedlce	886	2 289	3 175	101.2	104.0	102.4
23	Sieradz	-1 762	142	-1 620	96.1	100.5	97.8
24	Skierniewice	311	-6	305	100.6	100.0	100.4
25	Słupsk	-7 822	7 477	-345	92.2	110.6	99.8
26	Suwałki	758	738	1 496	101.1	102.2	101.5
27	Tarnobrzeg	-2 609	200	-2 409	94.8	100.4	97.5
28	Tarnów	-9 789	9 905	116	91.9	110.3	100.1
29	Wałbrzych	-17 235	-4 002	-21 237	87.0	95.2	90.2
30	Włocławek	-8 882	1 780	-7 102	92.7	102.9	96.1
31	Zamość	-2 311	1 769	-542	96.6	103.6	99.5
Total		-161 982	127 396	-34 586	94.5	106.9	99.3

\*CC- Core City, DIZ – Demographic Influence Zone, US – Urban System (CC+DIZ)

Consistent with the anticipated trends of the ongoing processes of suburbanisation of CC, in most cases (27) there was a decline in the population, while the DIZ significantly increased their demographic potential (only the DIZ of Wałbrzych was characterised by a population loss).

However, analysis of the entire urban system (US) balance indicated that slightly over half of them (16) showed regressive trends, i.e. the depopulation of the core city is not balanced out by the growing population of the demographic influence zone (the largest decline of over 5% was recorded in the USs of Wałbrzych, Jelenia Góra and Częstochowa). The remaining urban systems maintained a population growth (the largest, of over 8%, occurred in the USs of Nowy Sącz and Leszno).

Given the relationship between this process and the loss of the administrative function, the hypothesis of a direct impact on the degradation of the city is not confirmed. Almost half (48.4%) of urban systems did not suffer a population loss.

#### **4. Factors influencing population changes**

Among the elements influencing population changes in territorial units or their systems, the factors related to changes in administrative borders, the natural movement of the population and migratory movement are distinguished.

##### **4.1. The balance of changes of administrative borders**

Firstly, one should refer to the factors related to administrative changes. The analysis of administrative changes during the examined period was impeded by the difficulty in comparing the unit's area between the extreme years. The difference in the surface area between 2016 and 1999 is not equal to the administrative changes. This is due to the fact that the Chief Office of Geodesy and Cartography introduced a new method for calculating the area in 2005, based on computer data of the National Register of Boundaries and Areas of Territorial Division Units and systematically recalculating surfaces of all administrative units throughout the country. Therefore, the new values shown in the statistics often do not result from changes in administrative boundaries, but only from using a different calculation method. As a result of these recalculations in the former voivodeship cities, 4 of them (Legnica, Sieradz, Słupsk, Tarnów) did not change their area, 12 cities (Chełm, Częstochowa, Elbląg, Jelenia Góra, Konin, Koszalin, Krosno,

Nowy Sącz, Przemyśl, Radom, Skierniewice, Suwałki) increased their area, and 15 cities (Biała Podlaska, Bielsko-Biała, Ciechanów, Kalisz, Leszno, Łomża, Ostrołęka, Piła, Płock, Piotrków Trybunalski, Siedlce, Tarnobrzeg, Wałbrzych, Włocławek, Zamość) decreased their area.

Therefore, in the analyses of administrative changes, reference was made not so much to the difference in the area of the units in time as to all the changes occurring since the new territorial division of the country came into force on the basis of the decision of the Council of Ministers published in the Journal of Laws.

In view of the progressive process of suburbanisation, more and more cities are deciding to expand their administrative boundaries. While the situation is quite common among the current voivodeship cities, these changes occur on a much smaller scale in the case of the former voivodeship cities (Table 2).

Since 1 January 1999, only 7 former voivodeship cities out of 31 have made changes in their administrative boundaries. Six of them have increased their area, and one (Piotrków Trybunalski) reduced it by 113 hectares, which resulted in a reduction of the population by only 31 people. The remaining cities increased their area by over 34 km<sup>2</sup> in total, which resulted in a population growth of around 3,000 people. The biggest changes concerned two cities, Kalisz and Koszalin, which together covered over 85% of the area of growth for the entire group of former voivodeship cities.

Similarly, rather insignificant administrative changes concerned the units being part of the DIZ of the former voivodeship cities. Out of 31 DIZs, the gminas being part of less than half of them, i.e. 15 DIZ, made changes in their areas. The exchange of land occurred in three directions: 1) between the units within the zone, 2) with a former voivodeship city and 3) with areas outside the zone.

Overall, for the outcome of administrative changes, DIZs recorded land and population losses. A loss of land of 3,885 hectares and a population change of 3,889 people occurred in 84.6% in favour of areas of the former voivodeship cities (CC). Only 596 hectares, inhabited by 830 people, were transferred to gminas outside the zones. From that direction, DIZs gained 2023 hectares of land and 629 inhabitants. The biggest changes in this regard were in the DIZ of Suwałki<sup>2</sup> and DIZ of Leszno<sup>3</sup>. Changes within zones had the

<sup>2</sup> In 2010 the gmina of Rutka-Tartak incorporated 1105 ha and 245 people from the gmina of Wijązany.

<sup>3</sup> In 2000 the gmina of Włoszakowice incorporated 750 ha and 341 people from the gmina of Przemyśl.

smallest share of administrative shifts. These concerned only 565 hectares inhabited by 647 people. The most significant exchange took place in 2001, between the gminas of Ruja and Kunice in the DIZ of Legnica.

Given the area of former voivodeship cities, including the DIZ, these urban systems were enlarged by an area of 1,427 hectares. However, the expansion of the area was not associated

with population growth, because as a result of these changes, urban systems of the former voivodeship cities lost 201 people. In view of the fact that this is an extremely small balance, an assumption of the stability of urban systems of the former voivodeship cities can be adopted for further consideration, because they do not significantly affect the population changes.

Table 2. Balance of administrative changes in DIZ of the former voivodeship cities between 1999 and 2015  
(Source: Own study based on Local Data Bank)

DIZ name	Growth		Loss		Including exchange with CC		Exchange within DIZ	
	Area [ha]	Population [persons]	Area [ha]	Population [persons]	Area [ha]	Population [persons]	Area [ha]	Population [persons]
DIZ Bielsko-Biała			97	504				
DIZ Ciechanów			33	20	33	20		
DIZ Kalisz			1450	1381	1450	1381		
DIZ Konin	55	12						
DIZ Koszalin			1501	999	1501	999		
DIZ Legnica							516	544
DIZ Leszno	750	341	14	0				
DIZ Ostrołęka			47	499	47	499	9	0
DIZ Piła			87	3			38	103
DIZ Piotrków Trybunalski	113	31			113	31		
DIZ Przemyśl			239	160	239	160		
DIZ Skierniewice			171	0	19	0		
DIZ Suwałki	1105	245						
DIZ Tarnów			246	323				
DIZ Włocławek							2	0
Total	2023	629	3885	3889	3402	3090	565	647

#### 4.2. Impact of natural increase and the net migration rate

Natural increase and net migration rate are considered the most important factors affecting population changes. They affect both the pace of demographic development and the direction of change. They were presented in the form of demographic types according to Webb's typology.

The analysis of Webb's demographic types between 1999 and 2014 showed some regularity (Table 3). In the vast majority, the core cities of the former voivodeship cities represented depopulation types (F – 2 CC, G – 12 CC, H – 12 CC), where a high negative net migration rate was the most common cause of population loss. Only 5 cities represented progressive type A (Biała Podlaska, Leszno, Siedlce, Skierniewice and Suwałki), in which the negative net migration rate was exceeded by a

positive natural increase. Such selective analysis would lead to the conclusion that, after the loss of administrative rights, the former voivodeship cities have become exceptionally heavily depopulated, especially with the negative impact of migratory movements.

A slightly different image appears when the DIZs of the former voivodeship cities are included in the analysis. Like most suburban areas, they showed a different type of development. The DIZs largely represented progressive demographic types (A – 1 DIZ, B – 4 DIZ, C – 12 DIZ, D – 8 DIZ). In this case, migration movements also had the greatest impact on population growth. The depopulation type was represented by 6 DIZs (Sieradz, Skierniewice, Suwałki, Tarnobrzeg, Wałbrzych, Włocławek), and the negative natural increase was the most common factor deciding population losses. Therefore, DIZs were mostly

progressive types, where the population growth was due to new inhabitants settling down. It is apparent from the essence of the creation of suburban zones that they are mainly joined by the core city population. This regularity would justify the CC depopulation. However, as **DZIEWOŃSKI** (1987) and **SŁODCZYK** (2001) emphasise, the core

city and its suburban area are closely linked to each other both by commuting to work and by using services and the infrastructure. They should be considered as a coherent coexistent organism in which the development of one part benefits the other.

Table 3. Webb's average demographic type of in urban systems of the former voivodeship cities between 1999 and 2015  
(Source: Own study based on Local Data Bank and Baza Demografia)

No.	Former voivodeship city	Webb's average type in years 1999–2015			No.	Former voivodeship city	Webb's average type in years 1999–2015		
		CC	DIZ	US			CC	DIZ	US
1.	Biała Podlaska	A	D	A	17.	Piła	H	B	A
2.	Bielsko-Biała	G	C	C	18.	Piotrków Trybunalski	G	D	F
3.	Chełm	G	D	G	19.	Płock	H	D	A
4.	Ciechanów	H	C	H	20.	Przemyśl	G	C	G
5.	Częstochowa	G	D	F	21.	Radom	H	C	H
6.	Elbląg	G	A	G	22.	Siedlce	A	B	A
7.	Jelenia Góra	F	D	F	23.	Sieradz	H	E	G
8.	Kalisz	G	C	G	24.	Skierniewice	A	E	A
9.	Konin	H	C	A	25.	Słupsk	G	B	H
10.	Koszalin	G	C	C	26.	Suwałki	A	H	A
11.	Krosno	H	C	A	27.	Tarnobrzeg	H	G	H
12.	Legnica	G	D	G	28.	Tarnów	G	C	A
13.	Leszno	A	C	B	29.	Wałbrzych	F	F	F
14.	Łomża	H	C	A	30.	Włocławek	G	E	G
15.	Nowy Sącz	H	B	B	31.	Zamość	H	D	H
16.	Ostrołęka	H	C	A	Total		G	C	H

\*CC- Core City, DIZ – Demographic Influence Zone, US – Urban System

For this purpose, the fullest image is obtained when the CC and the DIZ are treated as one urban system. In such a case, migration movements between CC and DIZ are eliminated. The demographic types of the US were much more diverse. The progressive character characterised 15 US (A – 11 US, B – 2 US, C – 2 US), while the remaining 16 exhibited depopulation traits (F – 4 US, G – 7 US, H – 5 US). However, this balance is not the same, as the progressive types which increased the population number as a result of stronger positive natural increase, while the regressive types lost the population mainly as a result of a stronger negative net migration rate (Fig. 2). Also in the spatial distribution, it is difficult to find a regularity of

the regional distribution of demographic types of the former voivodeship cities and their surroundings. Thus, the results indicate that it is difficult to conclude unequivocally that a loss of the administrative function has negatively affected the demographic development of the former voivodeship cities. Firstly, they are subject to the same laws of settlement development as other urban centres, which result in the intensification of suburbanisation processes. Secondly, the demographic development of entire urban systems varies, suggesting the impact of other factors rather than the loss of the administrative function. Otherwise, all urban systems should definitely represent regressive types.



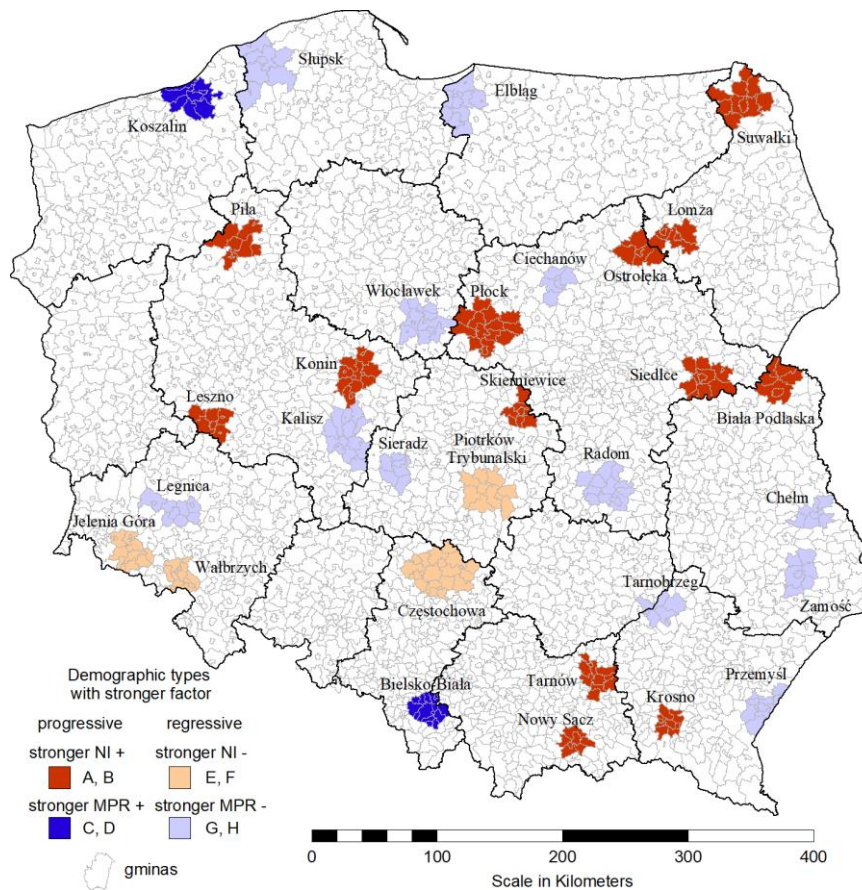


Fig. 2. Webb's average demographic type in urban systems of the former voivodeship cities between 1999–2015  
(Source: Own study based on Local Data Bank and Baza Demografia)

#### 4.3. Idealization

The simultaneous measurement of the impact of natural increase (NI), the net migration rate (MPR) and the administrative balance (AB) of the population development of the former voivodeship cities is the final stage of the analysis (Table 4). In the CC, the negative net migration rate exerted the biggest destructive impact. In the case of 13 cities, it was intensified by natural losses. The remaining ones (18) showed a positive impact of the natural increase factor, but only in 5 cities did it outweigh migration losses. The administrative changes did not have a greater significance in this regard, although generally this factor positively influenced the population change. It significantly increased the population resources only in Koszalin and Kalisz.

The migration factor had the most powerful influence on DIZ. In this case, however, in most zones the direction of influence was positive. Only 3 DIZs marked the negative influence of the migration factor (Elbląg, Suwałki, Wałbrzych). The natural increase factor was more diverse, but overall it played a positive role, albeit with less impact. Only in 3 DIZs did its negative strength exceed the positive impact of the net

migration rate (Sieradz, Skierniewice, Włocławek). Likewise, administrative changes acted in the opposite direction to those in the CC. They reduced the population potential of the DIZ, although to a small extent. In this respect, the zones of Koszalin and Kalisz recorded large losses.

The measurement of the influence of the population change factors in whole urban systems strongly pointed to the negative direction and the high strength (less than in CC) of migration losses. Only 4 USs of those analysed were positively influenced, and 3 were very strongly influenced (Bielsko-Biała, Koszalin, Leszno). In as many as 11 USs there was a very strong positive effect of the natural increase that exceeded the negative impact of the migration factor. Administrative changes in whole USs are negligible, as the largest exchanges took place between the CC and the DIZ.

In general, the analysis of the impact of individual factors on population changes indicates a very strong negative impact of migration movements. For this reason, large population losses in CCs cannot be balanced by the influx of people into the DIZ. USs mostly owe their development to natural increase. In that regard, one cannot unequivocally claim that the loss of administrative function remains without effect on the population

changes. In principle, only two centres, Koszalin and Bielsko-Biała, can be considered to be developing. Perhaps had it not been for the loss

of their administrative function, their development would be even stronger.

Table 4. The strength of influence of population change factors in the former voivodeship cities and their demographic influence zones (DIZs) in 1999–2015 (Source: Own study based on Local Data Bank and Baza Demografia)

No.	Former voivodeship city	CC			DIZ			US		
		NI	MPR	AB	NI	MPR	AB	NI	MPR	AB
		The value of the structure indicator								
1.	Biała Podlaska	51.5	-48.5	0.0	-32.8	67.2	0.0	57.2	-42.8	0.0
2.	Bielsko-Biała	-0.2	-99.8	0.0	21.0	76.4	-3.6	29.6	66.8	-3.6
3.	Chełm	-4.7	-95.3	0.0	-49.9	50.1	0.0	-34.7	-65.3	0.0
4.	Ciechanów	8.2	-91.2	0.6	17.4	79.3	-0.7	13.1	-86.9	0.0
5.	Częstochowa	-48.3	-51.7	0.0	-40.6	59.4	0.0	-83.1	-16.9	0.0
6.	Elbląg	-23.7	-76.3	0.0	55.0	-45.0	0.0	-3.5	-96.5	0.0
7.	Jelenia Góra	-56.8	-43.2	0.0	-34.7	65.3	0.0	-91.0	-9.0	0.0
8.	Kalisz	-34.9	-48.2	16.8	30.9	41.5	-43.2	-41.2	-58.8	0.0
9.	Konin	15.6	-84.4	0.0	35.2	64.6	0.2	69.9	-29.9	0.2
10.	Koszalin	-9.1	-62.2	28.7	22.1	62.5	-33.2	37.2	62.8	0.0
11.	Krosno	15.1	-84.9	0.0	42.0	58.0	0.0	51.7	-48.3	0.0
12.	Legnica	-30.2	-69.8	0.0	-29.1	70.9	0.0	-48.3	-51.7	0.0
13.	Leszno	75.0	-25.0	0.0	36.5	58.4	4.2	55.2	40.6	4.2
14.	Łomża	42.3	-57.7	0.0	37.7	62.3	0.0	52.2	-47.8	0.0
15.	Nowy Sącz	49.0	-51.0	0.0	66.3	33.7	0.0	99.3	0.7	0.0
16.	Ostrołęka	35.3	-58.9	5.8	26.4	65.0	-8.4	77.6	-22.4	0.0
17.	Piła	34.7	-65.3	0.0	57.4	42.5	-0.1	59.1	-40.9	-0.1
18.	Piotrków Trybunalski	-24.0	-75.5	-0.5	-44.1	55.1	0.6	-59.2	-40.8	0.0
19.	Płock	16.9	-83.1	0.0	-2.6	97.4	0.0	70.0	-30.0	0.0
20.	Przemyśl	-22.0	-75.1	2.9	41.3	51.8	-5.0	8.1	-91.9	0.0
21.	Radom	6.9	-93.1	0.0	40.0	60.0	0.0	45.6	-54.4	0.0
22.	Siedlce	72.0	-28.0	0.0	55.4	44.6	0.0	87.2	-12.8	0.0
23.	Sieradz	9.0	-91.0	0.0	-51.5	48.5	0.0	-27.8	-72.2	0.0
24.	Skierniewice	68.6	-31.4	0.0	-66.9	33.1	0.0	75.8	-24.2	0.0
25.	Słupsk	-20.8	-79.2	0.0	67.1	32.9	0.0	29.2	-70.8	0.0
26.	Suwałki	65.8	-34.2	0.0	31.6	-57.7	3.2	55.5	-41.3	3.2
27.	Tarnobrzeg	24.4	-75.6	0.0	-7.9	92.1	0.0	19.7	-80.3	0.0
28.	Tarnów	3.2	-96.8	0.0	45.7	51.2	-3.7	51.6	-44.7	-3.7
29.	Wałbrzych	-51.5	-48.5	0.0	-63.3	-36.7	0.0	-54.4	-45.6	0.0
30.	Włocławek	-26.0	-74.0	0.0	-55.1	44.9	0.0	-35.8	-64.2	0.0
31.	Zamość	30.2	-69.8	0.0	-38.3	61.7	0.0	22.1	-77.9	0.0
Total		-4.6	-93.5	1.9	20.8	76.2	-3.9	18.1	-81.6	-0.3

\*CC- Core City, DIZ – Demographic Influence Zone, US – Urban System (CC+DIZ)

NI - Natural Increase; MPR - Net Migration for Permanent Residence; AB - Net of Administrative Changes

## 5. Conclusions

The progressive suburbanisation processes require analysis of population changes in larger urban systems, including the zones of influence. The commuting and registration of the core city population indicator allowed us to distinguish the demographic influence zones of the former voivodeship cities. As a consequence of this, the analysis was conducted in 3 spatial dimensions (core city, demographic influence zone, urban system). There were significant differences between these zones in the trends of population changes. It was found that population changes showed strong losses in the CC, population increases in the DIZ and a diverse situation in the US – almost half of them exhibited increases and half losses.

These changes were influenced by three direct factors: natural increase, net migration rate and administrative changes. The measurement of the strength of influence of these factors showed that the migration factor had the greatest destructive significance for former voivodeship cities. It resulted in population loss in the CC and in whole urban systems. The strong positive impact of the migratory influx into the DIZ did not balance out the negative strength of this factor in the CC. In the case of USs showing population growth, they resulted from the positive influence of the natural increase factor, most often in the DIZ, but sometimes also in the CC. Administrative changes played an important role only in the case of exchanges between the CC and the DIZ (if any), without having a greater significance in the development of the entire US.

As regards the hypothesis put forward in the introduction the loss of the administrative function caused negative demographic consequences for former voivodeship cities. It was found that analysis of population changes does not indicate any impact of the loss of the administrative function on the degradation of the former voivodeship city. However, this applies only to a situation where we take the entire US into consideration. Indeed, in the vast majority of cases the CCs themselves have reported population losses (mainly in favour of DIZs) – but this process does not result from the loss of the administrative functions by these cities, but from the processes of suburbanisation occurring all over Poland (GAŁKA, WARYCH-JURAS, 2018; SZYMAŃSKA ET AL., 2009). However, when reference is made to the strength of the influences of the factors causing the administrative changes, this conclusion is no longer so unambiguous. All urban systems of former voivodeship cities were severely affected

by the negative impact of migratory movements. Only two of them (Koszalin and Bielsko-Biała) resisted this phenomenon.

The obtained results incline one to agree with the opinions (KURNIEWICZ & SWANIEWICZ, 2016; SOKOŁOWSKI, 2011; SZYMAŃSKA, 2015; WILK, 2004) that the loss of the function of a voivodeship capital has not affected the population and economic functioning of these cities in a significantly negative way.

## References

- Antipova E.A., Titov A.N. 2016. The Single-Industry Towns of Belarus: Differences in Demographic and Economic Development. *Journal of Settlements and Spatial Planning*, 7, 2, 126–136.
- Bartosiewicz B. 2015. Delimitacja obszarów funkcjonalnych małych i średnich miast w regionie łódzkim. *Studia Miejskie*, 18: 25–37.
- Baza Demografia, Statistics Poland, <http://demografia.stat.gov.pl/bazademografia/> [access on 14/1/2018].
- Bernt M., Coach C., Haase A., Cocks M., Grossman K., Cortese C., Krzysztofik R. 2014. Why and how does(n't) urban shrinkage get onto the agenda? Experiences from Leipzig, Liverpool, Genoa and Bytom. *International Journal of Urban and Regional Research*, 38, 5: 1749–1766.
- Berry B.J.L., Horton F.E. 1970. *Geographic perspectives on urban systems*. Prentice Hall, New Jersey.
- Bojkov V.D. 2003. Democracy in Bosnia and Herzegovina: Post-1995 political system and its functioning. *Southern European Politics*, 4, 1: 41–67.
- Budner W. 1999. Działalności administracyjne w strukturze funkcjonalnej miast średnich i dużych. *Czasopismo Geograficzne*, 70, 1: 19–30.
- Chabot G., Beauje-Garnier J. 1971. *Zarys geografii miast*. PWE, Warszawa.
- Chojnicki Z. 1999. *Podstawy metodologiczne i teoretyczne geografii*. Bogucki Wydawnictwo Naukowe, Poznań.
- Couch C., Leontidou L., Petschel-Held G. 2007. *Urban sprawl in Europe – landscapes, land-use change & policy*. Blackwell Publishing, Oxford.
- Czarnecki B. 2011. Manifestations and consequences of depopulation of Polish cities. Outline of the problem. *Architecturae at Artibus*, 3, 4: 13–20.
- Delaney A., Van Der Haar G., Van Tatenhove J. 2017. "If This Was a Normal Situation": Challenges and Potentials for Deliberative Democratic Peacebuilding in Kosovo's Emerging Governance Networks. *Public Administration and Development*, 37, 2: 136–152.
- Długosz M. 2017. Depopulacja aglomeracji wałbrzyskiej. *Konwersatorium Wiedzy o Mieście*, 2, 30, 19–25.
- Długosz Z., Biały S. 2015. Przemiany demograficzne w dużych miastach Polski na początku XXI w. [in:] M. Soja, A. Zborowski (eds.) *Miasto w badaniach geografów*. Tom 2. Instytut Geografii i Gospodarki Przestrzennej Uniwersytet Jagielloński, Kraków: 13–28.
- Drbohlav D. 2012. Patterns of immigration in the Czech Republic, Hungary and Poland. [in:] M. Okólski (ed.) *European Immigrations. Trends, Structures and Policy Implications*. Amsterdam University Press, Amsterdam: 179–209.
- Dziwioński K. 1967. *Baza ekonomiczna i struktura funkcjonalna miast. Studium rozwoju pojęć, metod i ich zastosowań*. Instytut Geografii PAN, Warszawa.

- Dziewoński K. 1972. Przegląd teorii sieci osadniczej, [in:] K. Sekomski (ed.) *Elementy teorii planowania przestrzennego*. PWN, Warszawa: 163–182.
- Dziewoński K. 1987. Strefa podmiejska – próba ujęcia teoretycznego. *Przegląd Geograficzny*, 59, 1–2: 55–64.
- Falkowski J. 2009. Zagospodarowanie podmiejskiej przestrzeni geograficznej w Polsce. [in:] I. Jażewicz (ed.) *Współczesne problemy przemian strukturalnych przestrzeni geograficznej*. Wydawnictwo Naukowe Akademii Pomorskiej w Słupsku, Słupsk: 217–232.
- Gałka J., Warych-Juras A. 2018. Suburbanization and migration in Polish metropolitan areas during political transition. *Acta Geographica Slovenica*, 58, 2: 63–72.
- Harasimowicz A. 2018. Suburbanizacja a rola obszarów otaczających miasto – ujęcie teoretyczne. *Studia Miejskie*, 29: 115–130.
- Hudson F. S. 1970. *A geography of settlements*. Mac Donald and Evans Limited, London.
- Ilnicki D., Michalski P. 2015. Powiązania funkcjonalno-przestrzenne w świetle dojazdów do pracy. *Studia Miejskie*, 18: 55–70.
- Kaczmarek T. 1996. *Rola funkcji administracyjnych w rozwoju średnich miast Wielkopolski (Gniezno, Kalisz, Konin, Leszno, Ostrów Wlkp., Piła)*. Bogucki Wydawnictwo Naukowe, Poznań.
- Kamińska W., Mularczyk M. 2014. Demographic types of small cities in Poland. *Miscellanea Geographica – Regional Studies on Development*, 18, 4: 24–33.
- Kantor-Pietraga I. 2014a. Both external and internal factors as an explanation of depopulation of cities on the area of Poland. *Environmental & Socio-economic Studies*, 2, 3: 56–64.
- Kantor-Pietraga I. 2014b. *Systematyka procesu depopulacji miast na obszarze Polski od XIX do XXI wieku*, Wydawnictwo Uniwersytetu Śląskiego, Katowice.
- Kantor-Pietraga I. 2015. In the shadow of urban development. Postwar depopulating towns in Poland, 1946–1990. *Environmental & Socio-economic Studies*, 3, 3: 37–46.
- Katchanovski I. 2016. The Separatist War in Donbas: A Violent Break-up of Ukraine? *European Politics and Society*, 17, 4: 473–489.
- Kollmorgen R. 2013. Theories of Postcommunist Transformation. Approaches, Debates, and Problems of Theory Building in the Second Decade of Research. *Studies of Transition States and Societies*, 5, 2: 88–105.
- Kolosov V. 2018. Radical shifts in Russian-Ukrainian relations and geopolitics of neighbourhood. *Journal of Geography, Politics and Society*, 8, 2: 7–15.
- Komorowski J.W. 2012. Miasta wojewódzkie a miasta postwojewódzkie w Polsce – zróżnicowanie i zmiany poziomu gospodarczego w pierwszej dekadzie XXI wieku, *Studia Miejskie*, 8: 9–25.
- Krysiński D. 2013. Wszystko, co złe to reforma. O utracie statusu miasta wojewódzkiego w dyskursie kaliszczan. *Przegląd Socjologiczny*, 62, 4: 25–42.
- Krzysztofik R., Szmytkie R. 2018. Procesy depopulacji w Polsce w świetle zmian bazy ekonomicznej miast. *Przegląd Geograficzny*, 90, 2: 309–329.
- Kurek S. 2011. Population changes in Poland: A second demographic transition view. *Procedia Social and Behavioral Sciences*, 19: 389–396.
- Kurniewicz A., Swaniewicz P. 2016. Phantom pain or a real loss? The impact of the loss of regional capital status on economic development and position in the hierarchy of the settlement system. *Prace i Studia Geograficzne*, 61, 2: 25–50.
- Lamprecht M. 2013. Fluctuations in the Development of Cities. A Case Study of Lodz. *Studia Regionalia*, 38: 77–91.
- Lesthaeghe R. 2011. The "Second Demographic Transition": A Conceptual Map for the Understanding of Late Modern Demographic Developments in Fertility and Family Formation. *Historical Social Research / Historische Sozialforschung*, 36: 179–218.
- Liszewski S. 1992. Funkcja administracyjna miast jako przedmiot badań geograficznych, *Acta Universitatis Lodzensis, Folia Geographica*, 17: 249–260.
- Lityński P. 2015. Degree and Features of Urban Sprawl in Selected Largest Polish Cities. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu. Polityka Ekonomiczna*, 402: 184–193.
- Lityński P., Hołuj A. 2017. Urban Sprawl Costs: The Valuation of Households' Losses in Poland. *Journal of Settlements and Spatial Planning*, 8, 1: 11–35.
- Local Data Bank, Statistics Poland, <https://bdl.stat.gov.pl/BDL/start> [access on 14/1/2018].
- Maik W. 1988. Rozwój teorii regionalnych i krajowych układów osadnictwa. UAM, Poznań.
- Maik W. 1992. Problematyka rozwoju polskiej geografii społeczno-ekonomicznej w świetle paradygmatycznych modeli pojęciowych. *Przegląd Geograficzny*, 64, 3–4: 231–246.
- Maik W. 1997. *Podstawy geografii miast*. Uniwersytet Mikołaja Kopernika, Toruń.
- Marszałek Ł. 2017. Changes in the number of population in large cities of Central and East-Central Europe. *Journal of Geography, Politics and Society*, 7, 4: 57–63.
- Mole R. 2012. *The Baltic States from the Soviet Union to the European Union: Identity, Discourse and Power in the Post Communist Transition in Estonia, Latvia and Lithuania*. Routledge, Abingdon & New York.
- Musiak-Malago M. 2016. The process of urban shrinking in Poland. *Studia Miejskie*, 24: 96–106.
- Mykhnenko V., Myedvyedev D., Kuzienko L. 2010. *Urban shrinkage in Donetsk and Makiivka, the Donetsk conurbation, Ukraine*, series: SHRIK SMART WP2 D4, [https://www.ufz.de/export/data/400/39019\\_WP2\\_report\\_Donetsk\\_Makiivka\\_NEW\\_kompr.pdf](https://www.ufz.de/export/data/400/39019_WP2_report_Donetsk_Makiivka_NEW_kompr.pdf) [access on 19/3/2018].
- Nelson H.J. 1955. A service classification of American cities. *Economic Geography*, 31, 3: 189–210.
- Norkus Z. 2012. *On Baltic Slovenia and Adriatic Lithuania. A Qualitative Comparative Analysis of Patterns in Post-Communist Transformation*. Apostrofa, Vilnius.
- Okólski M. 2018. Migracje zagraniczne. [in:] A. Potrykowska (ed.) *Sytuacja demograficzna Polski. Raport 2017–2018*. Rządowa Rada Ludnościowa, Warszawa: 196–231.
- Panecka-Niepsuj M. 2013. Przestrzenne zróżnicowanie sytuacji demograficznej miast średniej wielkości w Polsce. [in:] A. Zborowski (ed.) *Człowiek – Społeczeństwo – Przestrzeń*, III. Centrum Kultury Ekumenicznej, Instytut Geografii i Gospodarki Przestrzennej UJ, Myczkowce-Kraków: 63–84.
- Parysek J. 2004. The socio-economic and spatial transformation of Polish cities after 1989. [in:] M. Pak, D. Rebernik (eds.) *Cities in transition*. University of Ljubljana, Ljubljana: 109–120.
- Parysek J.J. 2008. Suburbanizacja i reurbanizacja: dwa bieguny polskiej urbanizacji. [in:] J. J. Parysek, T. Stryjakiewicz T. (eds.) *Region społeczno-ekonomiczny i rozwój regionalny*. Bogucki Wydawnictwo Naukowe, Poznań, 281–286.
- Parysek J.J., Mierzejewska L. 2009. Problemy funkcjonowania i rozwoju miast polskich z perspektywy 2009 r. *Rozwój Regionalny i Polityka Regionalna*, 9: 9–25.
- Pumain D., Saint-Julien T. 1978. *Les dimensions du changement urbain. Evolution des structures socio-economiques du*

- systeme urbain francais de 1954 a 1975. Centre National de la Recherche Scientifique, Paris.
- Roaf J., Atoyan R., Joshi B., Krogulski K., IMF staff team. 2014. *25 years of transition: post-communist Europe and the IMF*. International Monetary Fund, Washington.
- Runge A. 2011. Medium-sized towns in the context of size structural changes of towns in Poland. [in:] A. Runge, A. Kuczabski (eds.) *Medium-sized towns of Central-Eastern Europe in the period of economic system transformation and social changes*. Publishing House "ADNDU", Kharkiv: 88–87.
- Runge A. 2016. Urban agglomerations and transformations of medium-sized towns in Poland. *Environmental & Socio-economic Studies*, 4, 3: 41–55.
- Runge J. 2007. *Metody badań w geografii społeczno-ekonomicznej – elementy metodologii, wybrane narzędzia badawcze*. Wydawnictwo Uniwersytetu Śląskiego, Katowice.
- Runge J. 2008. Population Transformations in Traditional Economic Regions of Central Europe. Structural Approach. *Bulletin of Geography. Socio-economic Series*. 10: 63–74.
- Runge J., Kłosowski F. 2011. Changes in Population and Economy in Śląskie Voivodship in the Context of the Suburbanization Process. *Bulletin of Geography. Socio-economic Series*, 16: 89–106.
- Sagan I. 2000. Miasto – scena konfliktów i współpracy. Rozwój miasta w świetle koncepcji reżimu miejskiego. Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk.
- Śleszyński P. 2013. Delimitacja Miejskich Obszarów Funkcjonalnych stolic województw. *Przegląd Geograficzny*, 85, 2: 173–197.
- Śleszyński P. 2016. Współczesne i prognozowane uwarunkowania demograficzno-migracyjne w rozwoju miejskiego systemu osadniczego Polski. *Konwersatorium Wiedzy o Mieście*, 1, 29: 97–106.
- Ślodziński J. 2001. *Przestrzeń miasta i jej przeobrażenia*. Uniwersytet Opolski, Opole.
- Sobotka T. 2008. The diverse faces of the Second Demographic Transition in Europe. *Demographic Research*, 19: 171–224.
- Sokołowski D. 2011. Centralność większych miast Polski. Rola czynnika administracyjnego i globalizacji. [in:] B. Namyślak (ed.) *Przekształcenia regionalnych struktur funkcjonalno-przestrzennych*. IGIIR Uniwersytetu Wrocławskiego, Wrocław: 11–23.
- Spórna T. 2018. The suburbanisation process in a depopulation context in the Katowice conurbation, Poland. *Environmental & Socio-economic Studies*, 6, 1: 57–72.
- Spórna T., Kurpanik M. 2013. Socio-economic changes in the Rybnik conurbation (Poland) as a result of economic restructuring – a case study. *Environmental & Socio-economic Studies*, 1, 1: 38–47.
- Springer F. 2016. *Miasto Archipelag: Polska mniejszych miast*. Karakter, Kraków.
- Šprocha B., Bleha B., Vaňo B., Buček J. 2017. *Perspektívy, riziká a výzvy demografického vývojanajväčších miest Slovenska*. INFOSTAT – Výskumné demografické centrum, Bratislava.
- Staszewska S. 2013. *Urbanizacja przestrzenna strefy podmiejskiej polskiego miasta*. Bogucki Wydawnictwo Naukowe, Poznań.
- Suliborski A. 1985. Delimitacja strefy podmiejskiej Łodzi. Analiza pojęć i założeń metodologicznych. *Acta Universitatis Lodzensis. Folia Geographica*, 5: 213–229.
- Suliborski A. 2001. *Funkcje i struktura funkcjonalna miast. Studia teoretyczno-empiryczne*. Uniwersytet Łódzki, Łódź.
- Suliborski A. 2003. Koncepcja funkcji miejsca w badaniu zróżnicowania społeczno-gospodarczego regionu miejskiego. [in:] I. Sagan, M. Czepczyński (eds.) *Wymiar i współczesne interpretacje regionu*. Katedra Geografii Ekonomicznej UG, Gdańsk-Poznań: 217–225.
- Suliborski A. 2010. *Funkcjonalizm w polskiej geografii miast. Studia nad genezą i pojęciem funkcji*. Wydawnictwo Uniwersytetu Łódzkiego, Łódź.
- Sullivan W. C., Lovell S. T. 2006. Improving the visual quality of commercial development at the rural-urban fringe. *Landscape and Urban Planning*, 77, 1–2: 152–166.
- Szajnowska-Wysocka A. 1993. Funkcja administracyjna miast konurbacji górnośląskiej, *Geographia. Studia et Dissertationes*, 17: 100–115.
- Szajnowska-Wysocka A. 1995. *Podstawy zorganizowania miast konurbacji górnośląskiej*. Uniwersytet Śląski, Katowice.
- Szmytkie, R., Krzysztofik, R. 2019. The processes of incorporation and secession of urban and suburban municipalities: The case of Poland. *Norsk Geografisk Tidsskrift – Norwegian Journal of Geography*, 73: 2: 110–127.
- Szymańska D., Grzelak-Kostulska E., Hołowiecka B. 2009. Polish towns and the changes in their areas and population densities. *Bulletin of Geography. Socio-economic Series*, 11: 15–29.
- Szymańska W. 2015. The role of the administrative functions in the development of the city in Poland (by example of degraded towns). [in:] W. Szymańska (ed.) *Regional Development and Public Administration in the Context of General Tendencies of XXI century*. Publishing House "ADNDU", Słupsk-Kharkiv: 5–18.
- Szymańska W. 2018. Delimitacja strefy wpływów demograficznych na przykładzie byłych miast wojewódzkich w Polsce. *Space – Society – Economy*, 23: 7–28.
- Timofiejuk I., Lasek M., Pęczkowski M. 2003. *Miary statystyczne*. Główny Urząd Statystyczny, Warszawa.
- Walford N., Kurek S. 2016. Outworking of the Second Demographic Transition: National Trends and Regional Patterns of Fertility Change in Poland, and England and Wales, 2002–2012. *Population, Space and Place*, 22, 6: 508–525.
- Walkiewicz D. 2006. *Przemiany struktury funkcjonalnej miast wojewódzkich w latach 1975–1995*. Wydawnictwo Uniwersytetu Łódzkiego, Łódź.
- Węclawowicz G. 2016. Urban Development in Poland, from the Socialist City to the Post-Socialist and Neoliberal City. [in:] V. Szirmai (ed.) *"Artificial Towns" in the 21st Century. Social Polarisation in the New Town Regions of East Central Europe*. Institute of Sociology Centre for Social Sciences Hungarian Academy of Sciences, Budapest: 62–85.
- Węclawowicz G., Bański J., Degórski M., Komornicki T., Korcelli P., Śleszyński P. 2006. *Spatial organization of Poland at the beginning of the 21st century*, Polish Academy of Sciences. Stanisław Leszczycki Institute of Geography and Spatial Organization PAS, Warsaw.
- Wendt J. 2001. *Geografia władzy w Polsce*. Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk.
- Wilk W. 2004. The effect of changes in administrative division on the economic position of the largest cities in Poland. *Miscellanea Geographica – Regional Studies on Development*, 11: 241–247.
- Wilson Ch. 2013. Thinking about post-transitional demographic regimes: A reflection. *Demographic Research*, 28: 1373–1388.
- Wilson G.A. 2012. *Community Resilience and Environmental Transitions*. Routledge, London and New York.
- Zborowski A., Soja M., Łobodzińska A. 2012. Population trends in Polish cities – stagnation, depopulation or shrinkage? *Prace Geograficzne IGIiP Uniwersytetu Jagiellońskiego*, 130: 7–28.