

## **APPARENT AND ACTUAL DEPOPULATION OF MEDIUM-SIZED CITIES OF THE TRANSBORDER REGION OF PODKARPACIE VOIVODSHIP**

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### **ABSTRACT**

As the demographic potential of the city is not only determined by the population living within its administrative borders, research into depopulation processes of urban centres should also take into account changes in their functional areas. The article proposes a method of classifying depopulation cities into centres depopulating apparently (relatively) and actually (absolutely) and whose main differentiating criterion is the degree of advancement of suburbanization processes. The research was carried out in nine medium-sized cities of the Podkarpackie Voivodship in the time covering the years 1996–2016. The conducted analysis showed that absolute depopulation did not concern all examined centres, despite the decrease in the number of inhabitants in each city.

**Key words:** depopulation, suburbanization, urban shrinkage, medium cities.

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### **1. Introduction**

Depopulation understood as a statistical depiction of population loss (Kantor-Pietraga, Krzysztofik, Runge, 2012) is a concept inseparably connected with the process of urban shrinkage – one of the most important socio-economic and spatial phenomena characterizing the contemporary urban network of Poland and Europe (Mykhnenko, 2008)<sup>3</sup>.

Depopulation of cities is not a one-dimensional or single-threaded phenomenon. An extremely important and often overlooked (especially in popular

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<sup>3</sup> Depopulation is a narrower concept than the urban shrinkage, which is understood as a multifaceted process (not only demographic but also economic, social, spatial or political), whose main manifestation is the loss of population (Kantor-Pietraga, 2014).

science and popular publications) aspect of this process is the fact that not all centres that are characterized by the loss of population, actually lose their basic resource which is the demographic potential. The reason is that the city as a settlement unit does not function in a vacuum. On the contrary – it is strongly connected with its hinterland (suburban area, functional area). Therefore, the research on demographic processes taking place in the city, limited only to administrative boundaries, may lead to erroneous conclusions regarding the actual demographic condition of the centre, as well as prospects for its development or general attractiveness as a place of residence.

The answer to this problem is the distinction between apparent and actual or relative and absolute depopulation<sup>4</sup>. In this approach, the city's administrative boundaries are considered only from the legal and organizational point of view and the key issue is changes in demographic potential in the entire urban region (Kantor-Pietraga 2014). Despite the fact that the aspect related to the perception of both these phenomena appears in the studies on depopulation of cities, there is no classification based on which municipal centres could be compared in this respect.

In the literature, medium-sized cities in most cases are centres with a range of 20-100 thousand inhabitants, where the lower and upper boundaries are often contractual and ambiguous<sup>5</sup> (Runge, 2012). Such medium-sized cities constitute nowadays approximately 1/5 of all urban centres in Poland and are responsible for about 1/3 of the total urban population. The Podkarpackie Voivodship stands out in this respect against the background of the country and other regions, because the share of medium-sized cities has a relatively greater significance in its case.

Recently, however, more and more importance has been attached to the fact that the Polish settlement system is in a state of increasing imbalance, which adversely affects the territorial cohesion of the country. This is evidenced by an ongoing discussion on the possibilities of changing the existing paradigm of regional and urban policy that is based on the polarization-diffusion model. A visible effect of this discussion is, among others, the provisions of the government's *Strategy for Responsible Development* (2017) and the expertise developed for its needs – *Delimitation of medium-sized cities losing their socio-economic functions* (2016). As a result, 122 medium centres were identified (out of 255 included in the research), in which the greatest intensity of socio-economic problems occurs. All cities from the Podkarpacie region with a population

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<sup>4</sup> Harańczyk (2016) uses the terms apparent shrinkage and actual depopulation, while Kantor-Pietraga (2014) describes these same phenomena as relative and absolute depopulation. In the article, the concepts: real and absolute, as well as apparent and actual will be used interchangeably

<sup>5</sup> In the case of the Podkarpackie Voivodship, the border between small and medium centers is quite severe – the largest city classified as small does not exceed 19 thousand inhabitants, while the smallest medium center inhabits over 35 thousand people.

of 20–100 thousand entered this group, which was significantly influenced by the indicators related to their current and forecasted demographic situation.

In connection with the above, an attempt was made to assess urban centres in terms of actual depopulation or rather the occurrence of the phenomenon of local redistribution of residents - mainly related to the processes of suburbanisation. The paper proposes a typology based on the proportions of real population traffic in the city-core and its suburban area.

The cognitive objective of the research aims to examine the actual demographic potential of medium-sized cities in the Podkarpackie Voivodship and to determine which centres in the period covered by the analysis, i.e. 1996–2016, have actually been depopulated, and in which this process was apparent.

The spatial scope of the work was limited to the Podkarpackie Voivodship, precisely nine cities located in its area, in which the population decreased, were analysed in detail. The interest in this size category stems mainly from the fact that the character of demographic changes – including depopulation processes – in medium-sized cities is not as well recognized as in the case of large (especially metropolitan)<sup>6</sup> centres. It is related to the polarization that has been visible for years, manifested by directing research interests towards the extreme size groups of the largest and the small cities (Runge, 2013).

## 2. Research methods

In the first stage of the research, changes in the number of population in all cities of the Podkarpackie Voivodship in the years 1996–2016 were analysed. On the basis of indicators of population dynamics, regressive cities (in which the dynamics rate was below 95%), stagnant (dynamics within 95–105%) and progressive (dynamics above 105%) were distinguished. Next, the research was concentrated on nine medium centres to illustrate the scale of transformation in terms of real population growth in these cities. The demographic typology according to J. Webb was used, which distinguishes eight basic types of units (marked with letters A to H) depending on the relation between the natural growth (loss) and migration balance<sup>7</sup>.

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<sup>6</sup> Among metropolitan centers, a different trajectory of depopulation processes is most visible in Łódź and Poznań – in the case of the first city depopulation occurs in the whole agglomeration whereas in the metropolitan area of Poznań an increase in the number of inhabitants occurs- despite their outflow from the city-core (Szukalski, 2015). Using the terminology adopted in the article, Łódź should therefore be described as a center in which real depopulation occurs, Poznań – as a city that is apparently depopulating.

<sup>7</sup> Types A, B, C, D include units with a population growth (development types, demographically active), while types E, F, G, H include units in which the population decreases (inactive types). The most favorable situation occurs in units from the B and C groups (both positive natural increase and migration balance), the least favorable is characterized by F and G type units (negative values for both processes constituting the real increase).

The main part of the research was an attempt to systematize depopulation centres in connection to the relation: city – suburban area. For this purpose a classification was proposed, consisting in distinguishing four types of cities (Table 1). Depending on the demographic situation in the municipalities constituting suburban areas of depopulation centres, depopulation may be of an apparent (relative) nature – when the number of inhabitants in the entire urban region increases or does not change, or actual (absolute) – when the number of inhabitants in the entire urban region is declining.

**Table 1.** Typology of depopulation centres according to the city-suburban area relation

Type of depopulation centre	Change in population during the considered period			character of depopulation
	Total urban area	Core	Suburban area	
<i>W</i>	Population growth	Population decrease	An increase in the population more than compensating for the loss in the core	relative
<i>B1</i>	Stagnation or population loss (often insignificant)	Population decrease	Population growth compensating for loss in the core in the 50-100% range	relative / absolute
<i>B2</i>	Population decrease	Population decrease	Population growth compensating for loss in the core in the 0-50% range	absolute
<i>B3</i>	Population decrease	Population decrease	Population decrease	absolute

*Source: Own study.*

The main problem in the research of depopulation processes in this context is the delimitation of suburban areas, understood as areas functionally closely related to the city-core. The delimitation of the functional areas of the Podkarpackie Voivodship was carried out by the Podkarpackie Land Management Office for the city of Rzeszów as the voivodship capital and for subregional centres – Krosno, Mielec, Przemyśl, Stalowa Wola and Tarnobrzeg (Functional Areas ..., 2015). For the purposes of this research, it was assumed that for the other medium centres (Dębica, Jarosław, Sanok and Jasło) the suburban areas will be the areas of municipalities directly adjacent to them.

### 3. Changes in the population in the cities of the Podkarpackie Voivodship in the years 1996-2016

In the years 1996–2016, the number of urban population of the Podkarpackie Voivodship increased by 8.1 thousand i.e. less than 1% (866.1 thousand in 2016 compared to 868,000 in 1996). This change was a derivative of the co-occurrence of the following processes:

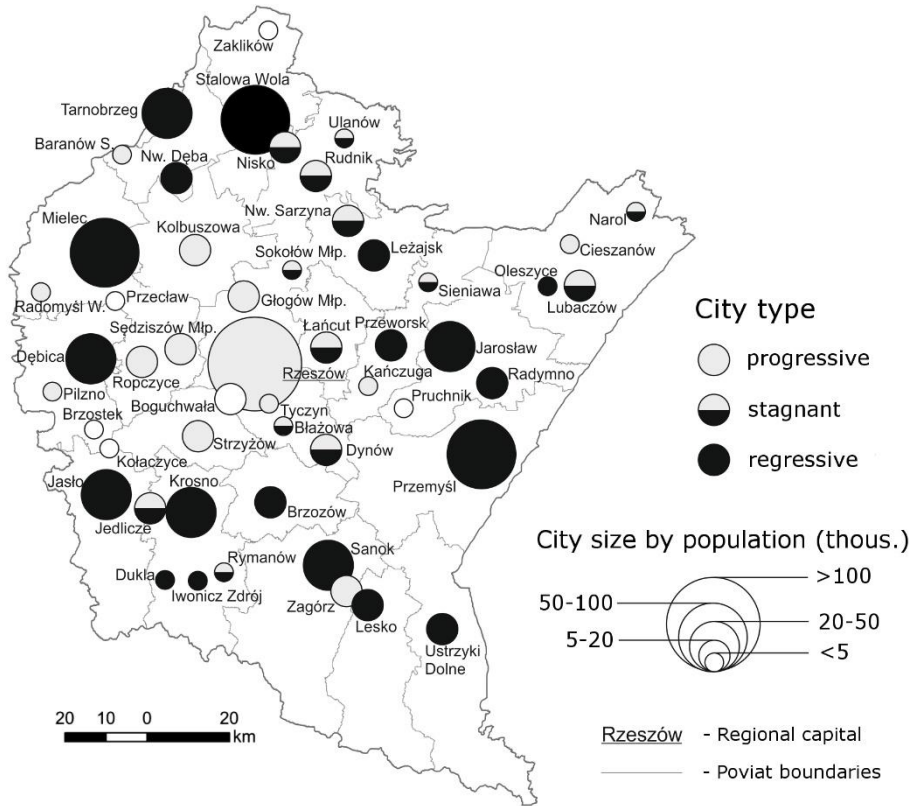
1. Decrease in the number of inhabitants in 26 cities. In total, these centres reduced the population by almost 48 thousand people (only in medium-sized cities the loss amounted to over 39 thousand).
2. Increase in the number of inhabitants of Rzeszów – in the analysed period there was an intensive development of the city in terms of territoriality<sup>8</sup>, which also had an impact on a significant increase in the number of inhabitants – a total of over 26.5 thousand people.
3. Increase in the number of inhabitants in the remaining 18 cities. In total, these centres increased population by just under 10.7 thousand people.
4. Increase in the total number of cities – in the analysed years six municipalities obtained city rights, which in the initial year of the analysis did not have city rights – in 2016 they were inhabited by 18.7 thousand people.

The demographic situation in the cities of Podkarpacie is therefore very dynamic, which is visible only at the level of individual units (Figure 1). Using the rate of population dynamics, cities with *progressive, stagnating and regressive* types were distinguished.

*Progressive cities* were marked by a significant increase in the number of inhabitants (rate of dynamics above 105%). A characteristic feature of this group of 13 cities is the fact that, apart from Rzeszów, almost exclusively small centres with a population below 10,000 inhabitants constituted this group (the only exception is Ropczyce – 15.7 thousand), mostly located in the central part of the voivodship (some of them are part of the Rzeszów agglomeration). In 2016, they were inhabited by 30.2% of the total urban population.

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<sup>8</sup> The city's area in 1996 amounted to 53.7 km<sup>2</sup>, while in 2016 to 116.4 km<sup>2</sup> – an increase of over 116%. Relatively densely populated areas were connected to the city, which contributed to the rapid increase in the population of the voivodship capital.



**Figure 1.** Types of cities in the Podkarpackie Voivodship according to the dynamics of the population in 1996-2016

Source: Own study based on Statistics Poland LDB data.

*Stagnant cities* (dynamics rate 95% – 105%) are those that can be, in a simplified manner, treated as threatened by depopulation – they covered 13 units – their inhabitants accounted for less than 11% of the surveyed urban population due to the lack of major centres in this group.

The most numerous group were *regressive cities* (dynamics rate below 95%). The centres, which were characterized by a decisive decrease in the population, were 19 in total, and in 2016 they were inhabited by almost 59% of the Podkarpackie urban population. The reason for such proportions is the fact that this group includes all medium-sized cities and, at the same time, only two very small centres of less than 5,000 residents.

Considering the changes in the population of the studied cities in the size class system, the emerging demographic trends that characterize each class can be observed (Table 2).

**Table 2.** Changes in the number of population in the cities of the Podkarpackie Voivodship in the years 1996–2016 divided into size classes

The size class of cities	Number of cities	Population 1996 (thousand)	Population 2016 (thousand)	Dynamics (%)
Up to 5 thousand	15	39,2	41,2	105,1
5-20 thousand	20	191,2	191,1	99,9
20-50 thousand	6	271,7	252,7	93,0
50-100 thousand	3	205,1	185,1	90,2
Above 100 thousand	1	160,8	187,4	116,5
<b>Total</b>	<b>45</b>	<b>868,0</b>	<b>857,4</b>	<b>98,8</b>

Source: Own study based on Statistics Poland LDB data.

Smallest cities class (up to 5,000 inhabitants) was characterized by a general increase in the number of inhabitants – out of 15 centres 10 – i.e. 2/3 noted an absolute increase in population.

Small towns class (5–20 thousand inhabitants) – the most numerous and internally diversified, was characterized by stagnation in the population number. This situation was influenced by, among others, the fact that this group included cities with a dynamic growth in the number of inhabitants – e.g. Głogów and Sędziszów Małopolski – as well as centres with clearly regressive tendencies (Nowa Sarzyna, Lesko).

A very clear downward trend is visible in the case of medium-sized cities (divided into two size classes: 20–50 thousand and 50–100 thousand inhabitants). Each of the nine cities in this group recorded a clear, at least a few percent, decline in the number of inhabitants during the period under consideration.

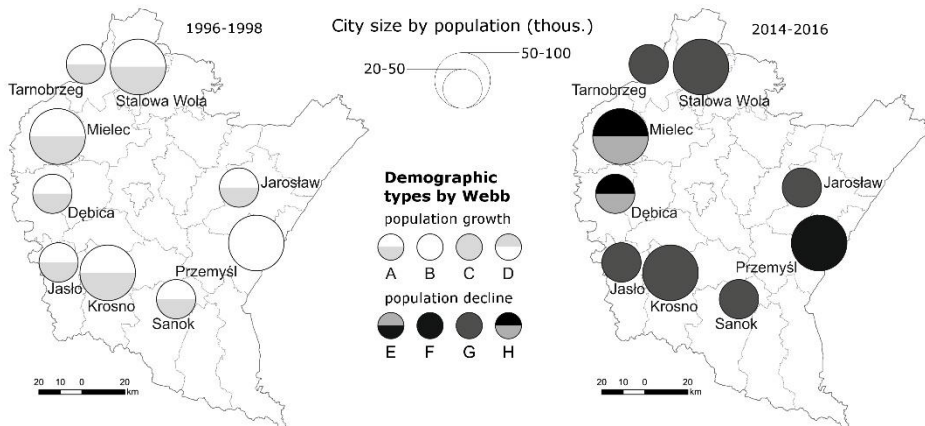
The last class – cities over 100,000 inhabitants – is represented by, the already mentioned, Rzeszów, which recorded a significant population growth.

The above data prove that the changes in the urban population in the Podkarpackie Voivodship depend, to a large extent, on the demographic condition of medium-sized cities, which despite a very large decrease in the number of inhabitants compared to 1996, are still inhabited by about half of the city's population<sup>9</sup>.

<sup>9</sup> In 1996, the population of medium-sized cities accounted for 55% of the total urban population of the Podkarpackie Voivodship, in 2016 this value decreased to less than 50%.

Using the demographic typology of J. Webb, which constitute a good illustration of the huge transformation in terms of real population growth, the types of medium-sized cities of Podkarpacie were identified (in order to become independent from accidental annual fluctuations, the research used three-year means for 1996–1998 and 2014–2016) compiled in the figure 2.

In the years 1996–1998, all medium-sized cities were characterized by active demographic types. Eight represented Type A, meaning the increase in population resulting from a positive natural increase, which more than compensated for the negative migration balance. The exception was Przemyśl, located in the most favourable situation, where apart from a positive natural increase - also a positive migration balance (type B) was noted.



**Figure 2.** Demographic typology of J. Webb for medium-sized cities of the Podkarpackie Voivodship

*Source: As in Figure 1.*

In the following years depopulation of medium centres appeared, which is reflected in the diametrical change of their demographic types. In the years 2014–2016, all cities represented inactive types. Seven cities with G or F types (characterized by a double negative trend) were in the most disadvantageous situation. In a slightly better demographic condition were Dębica and Mielec (type H), characterized by a positive natural increase, however, they were not able to compensate for the migration outflow.



#### 4. Typology of depopulation centres from the point of view of relations between the city and the suburban zone

Urban depopulation processes should not be considered solely within their administrative borders. In order to make a comprehensive assessment of the phenomenon and answer the question – whether the city became unattractive and ceased to attract new residents, or only the local arrangement of their redistribution in the city-suburban area changed, the distribution of demographic processes should also be taken into account in the surrounding areas (Kantor-Pietraga 2014).

In connection with the above, it was proposed to distinguish four types of cities (W, B1, B2, B3 – Table 3, Fig. 3), which refers to the division into apparently (relatively – W) and actually (absolutely B) depopulated centres.

**Table 3.** Types of selected depopulation centres in the Podkarpackie Voivodship in 1996–2016

Urban region (core)	The dynamics of the population in the years 1996-2016			Centre type	The nature of depopulation
	Total	Core	Suburban area		
Dębica	102,6	94,5	110,9	W	relative
Krosno	101,0	94,1	106,2	W	relative
Mielec	99,9	94,0	112,7	B1	absolute
Sanok	99,3	92,2	109,8	B1	absolute
Jarosław	98,5	91,3	108,4	B1	absolute
Jasło	97,9	91,6	104,2	B2	absolute
Przemyśl	97,6	90,0	110,9	B1	absolute
Tarnobrzeg	95,1	93,5	96,6	B3	absolute
Stalowa Wola	93,7	87,0	105,2	B2	absolute

Source: As in Table 2.

The research revealed a significant diversity of depopulation centres, in the context of their relationship with the surrounding suburban areas. In the most favourable situation were two cities classified as *type W* – Dębica and Krosno – the depopulation process here was of an apparent nature, as the population growth in the suburban areas more than compensated for their loss in the main city. The decline in the core population did not, therefore, reduce the demographic potential of the entire urban region. Such a situation may not always have a negative character, because from the point of view of the local settlement system, the city is still an area used by the same, additionally increasing number of inhabitants

(Kantor-Pietraga 2014). The fundamental issue conditioning negative or positive evaluation of the phenomenon is, in this case, the nature of suburbanization processes. If they are planned, they can be assessed positively, whereas if suburbanization is a free "urban sprawl", then most often it gains a negative connotation.

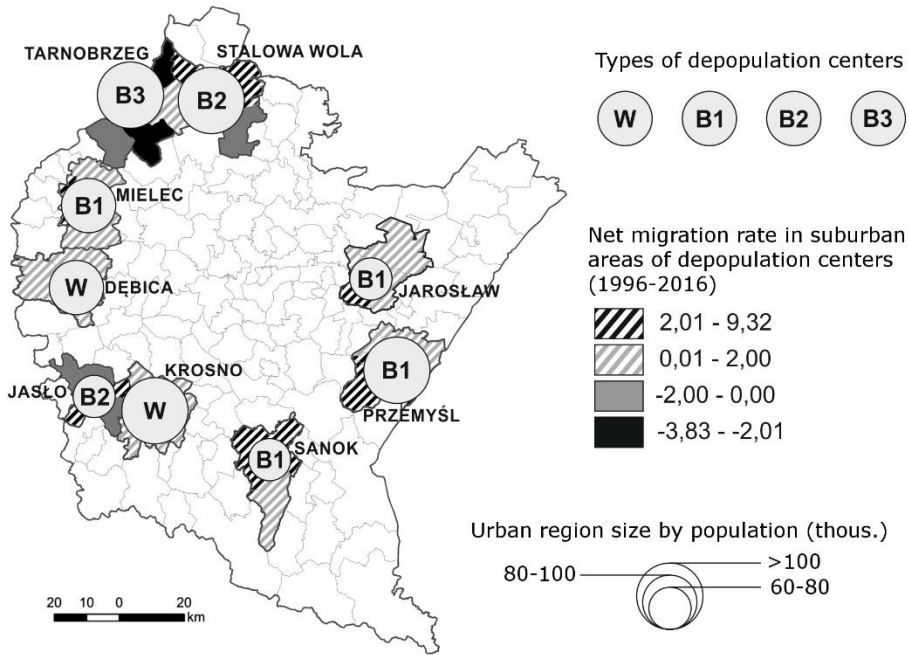
The demographic situation of cities classified as *type B1* is also much better than it would result from the analysis of the core alone. In the case of these centres, one can generally speak of stagnation or a slight decline in the population in the entire urban region. The suburban area compensates for the deficit in the core almost completely (in Mielec the compensation amounted to 97%) or to a significant extent (in Sanok it amounted to almost 86%, in Jarosław over 70%, in Przemyśl less than 63%). This is reflected in relatively high rate of population dynamics for the entire urban region (in the case of Mielec it is close to 100%).

In a much less favourable situation are centres qualified for *type B2*. In their case, some suburbanisation tendencies are noticeable, but they are not so advanced (in relation to the scale of outflow of inhabitants from the city-core) to, at least partially, compensate for the population loss that takes place in the main city. Of the cities studied, the type B2 is represented by Jasło and Stalowa Wola. An interesting situation, in the discussed case, is Stalowa Wola. This centre had the most suburbanized suburban area (the highest absolute value of the migration balance in suburban municipalities compared to the areas of the remaining cities), however, the huge scale of population decline in the core (over 9.3 thousand people, i.e. a decrease by 13%) caused a large migration inflow to suburban municipalities that did not translate into a high degree of compensation in the entire urban region (compensation at the level of 23.4%).

Tarnobrzeg, representing type B3, was in the least favourable situation. In the case of this centre, a depopulation of both the main city and its surroundings occurs, which is definitely a disadvantage for the local settlement system and may prove a permanent destabilization of its developmental bases. The outflow of people from both the city and its hinterland is a clear signal that the city is struggling with problems that may be complex (economic, political and social). In type B3 centres, suburbanisation processes (if at all) are characterized by a very low degree of advancement - out of the four municipalities forming Tarnobrzeg suburban, only one was characterized by a positive migration balance in the surveyed period, the other three were characterized by a significant migration outflow (Figure 3).

The comparison of two former voivodship cities – Krosno and Tarnobrzeg, which represent extreme types according to the proposed classification, clearly illustrates the need to analyse the processes of depopulation of cities in a broader context. When examining the changes in the population of both units within their administrative borders, it can be concluded that in the face of the similar scale of population decline in the last two decades, both Krosno and Tarnobrzeg are

struggling with similar problems that lead to not only the decline in attracting new residents, but also creating favorable conditions for people living there. However, the observation of changes in the environment of both cities suggests that this phenomenon is complex. The apparent depopulation that was observed in the case of Krosno is not proof of its economic weakness.



**Figure 3.** Types of selected depopulation centres in the Podkarpackie Voivodship and migration balance in their suburban areas in the years 1996–2016

Source: As in Figure 1.

The real outflow of people from the Tarnobrzeg region is, however, a strong premise to state that the city's economy is struggling with serious problems. These assumptions are confirmed, among others, in research on the condition of local labour markets in Podkarpacie cities, which shows that currently among medium-sized cities, in the most favourable situation is the labour market in Krosno (relatively high rate of job saturation, favourable employment structure), and the least favourable – in Tarnobrzeg, where low levels of saturation in the workplace are observed, and the structure of the employed is poorly diversified and shows significant dependence on the non-market services sector (Baran, Tomaszewski 2016).

## Summary

When examining changes in the demographic potential of a city, it is worth remembering that its situation is not determined solely by statistical loss or population growth within administrative boundaries. The fluctuations of the population in the entire urban area seem to be much more important.

The conducted research revealed that over the last twenty years, out of the nine medium-sized cities of Podkarpacie, in the case of two – Dębica and Krosno – the depopulation was of an apparent nature. Thanks to the advanced suburbanisation processes, the demographic potential of both centres grew. The situation observed in Mielec is also relatively good, where the population decline has been almost fully compensated by the suburban area, which makes it difficult to explicitly qualify it as a centre that is depopulating actually. In the least favourable situation, however, are two cities located in the northern part of the voivodship – Tarnobrzeg and Stalowa Wola, in the case of which there was a process of real and clear outflow of population from their suburban areas.

The fact that the demographic situation of some medium-sized cities is slightly better than the data on population movement in their administrative borders would indicate, does not change the strong polarization that characterizes the contemporary urban network of the Podkarpackie Voivodship. This polarization is manifested by clear upward trends in the number of inhabitants in the Rzeszów agglomeration with simultaneous depopulation trends in medium centres. This process causes that although medium-sized cities maintain their position within the local settlement networks, the process of their marginalization towards the voivodship's capital is also deepened.

Although the demographic changes taking place in cities and their surroundings are different depending on the size of the centre (Chądzyńska 2016), it seems that due to the universality of the proposed typology, it can be applied to all depopulated cities, regardless of their size category. A thorough analysis of the conditions of the discussed phenomena requires additional research indicating the conditions for occurring changes. The adopted method may also be helpful in determining the causes of depopulation of cities, providing a good approximation of the processes actually occurring in them and related to the coexistence of depopulation and suburbanisation.

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