

# DEMOGRAPHIC AND SOCIAL TRANSFORMATIONS OF EASTERN PART OF THE POLISH-CZECH BORDERLAND

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## Abstract

The aim of the article is to assess the diversity of population transformation trends in towns compared to their surrounding non-urban areas and to identify relationships occurring between them in the context of the demographic development of the Czech-Polish borderland. The area under study consists of the Moravian-Silesian Region on the Czech side and of the southern part of the Silesian Voivodeship on the Polish side. The components of population growth in the years 1995–2013 were examined. Statistical material was obtained from statistical offices in Poland and in the Czech Republic. Two research methods were applied in order to understand the relationship between natural increase and natural loss and net migration. Firstly, the Webb method was used. Another applied method was the Długosz's typographs method, on the basis of which an attempt was made to create typology of cities. The analysis revealed that the Czech and the Polish part of the borderland differ in development of population growth, as on the Polish side, there was an increase in population, whereas on the Czech side, population decreased. Some similarities were observed as well, such as the depopulation of towns and cities for the benefit of their surrounding rural areas.

**Key words:** the Polish-Czech borderland, demographic and social transformations, Długosz's typograph, Webb typology.

## INTRODUCTION

The existence of borders is an issue implying problems of areas in which they function, because the fundamental issue of each border is the separation of two different areas (Otok 2002; Gregory et al. 2009). The subject of borders has been undertaken by numerous researchers, including Prescott (1987) or Anderson and O'Dowd (1999). Contemporary studies highlight that borders still exist and are of importance (Best 2007), but their status is changing and they are becoming more and more complex (Paasi 2012). The areas that are adjacent to the borderline or that remain within its impact are given various names. The most commonly used terms include a border zone, a borderland, a frontier area,

a border region, and a cross-border region. Such a diversity of terms results, among others, from the fact that areas along the border are the subject of research for specialists in many fields, for example geography, political science, law, history, sociology and ethnology, which delimit them differently.

A general definition of the frontier was provided by Prescott (1987, in Donnan and Wilson 2007) in reference to transition zones within which borders are located. Borderlands are areas located in the peripheral zone of a country, and are frequently composed of rural areas. This location causes a degradation of the social and economic state of these areas. The peripheral location might also be a result of remoteness from the centre, constituting the place of the

highest economic activity (Rykiel 1990; Paasi 1999; Nelles and Durand 2012). Such a state of events undergoes changes because distance is becoming less important than availability, which leads to a decrease in the border's importance as a barrier.

Reality shows, however, that even though geographically it is always a peripheral zone, in socio-economic terms, it needs not always be true (Ciok 1990). The borderland may be an economically backward area, but in terms of industry or services it may also be a highly developed industrial region (Ciok 1990, 2004). Examples of this fact are the Polish-Czech-German border (Johnson 2009) or the Golden Triangle: Vienna-Bratislava-Győr (Rajčáková 2005).

According to the concept of a junction region by Rykiel (1985), along with the socio-economic development of peripheral areas located in the vicinity of the border, in relation to the management centre, after some time, a transformation of the territory into an integrated region might occur. Such a region is characterized by the occurrence of many consistent, high-intensity spatial and structural, socio-economic, ecological, and information technology relationships.

The borderland range is established using the application of various delimitation criteria (Table 1). The following definition was adopted in the study:

“The frontier area is composed of spatial units adjacent to the border on both sides. The width of the frontier area can be limited only to the spatial units directly adjacent to the state border, or it may be broader, as a derivative of specific socio-economic relations in the border area” (Runge 2003c:14).

In Polish academic literature, a particular interest in borderland areas was recorded in the 1990s. At that time, research on various aspects of their functioning was conducted. One example of such an activity was a research project carried out in 1999–2002, under the name of “A Territorial Socio-Economic System of the Frontier of the Province of Silesia and Northern Moravia and Strategies for its

Development in the Transition Period of the Economies of Central and Eastern European Countries”. At that time, the spatial and functional structures of the borderland of the Province of Silesia and Northern Moravia were diagnosed and conditions and strategies for socio-economic transformations were presented. The spatial range of these studies included Cieszyn Silesia (Runge 2003a).

Publications resulting from this project were the inspiration to undertake the subject of the Polish-Czech border. Attention should be drawn again to the area, which has a peripheral nature in the systems of both countries, however, on a regional scale – only some of its parts are clearly peripheral in their nature (Heffner 1998). The fact that the issue of the Polish-Czech border needs to be re-examined is supported by the specific physical and geographic location of the area, the historic specificities and the changes resulting from contemporary urban processes.

The purpose of the article is to indicate the differentiation of population transformation tendencies in towns, compared to the surrounding non-urban areas and to determine relationships occurring between them in the shaping of the demographic development of areas located on both sides of the national border.

The area under study was defined in an objective, administrative manner. It encompasses the part of the Polish-Czech borderland included in the Interreg V-A Programme Czech Republic-Poland for 2014–2020 under the European Cross-Border Cooperation (ECBC), which is the Moravian-Silesian Region on the Czech side, and the southern part of the Silesian Voivodeship (the Bielsko-Biala and Rybnik sub-regions and the Pszczyna district of the Tychy sub-region). It is presented in Figure 2. The time range essentially covers the period from 2000 to 2013, however, in relation to the districts, it was extended, and changes for the years 1995–2013 were shown.

The review of the literature dealing with border areas in the Silesian Voivodeship and the Polish-Czech border indicates a shortage of current literature. Only few scholars undertook the subject

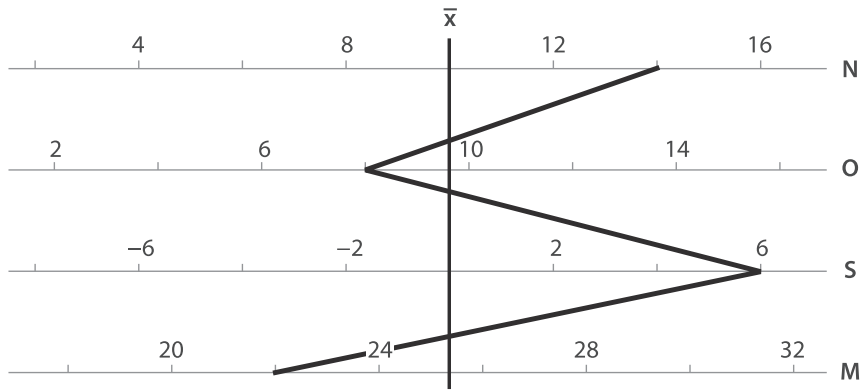
**Table 1** Types of borderland delimitation. Source: Málíková et al. (2015); Bufon (2007); Jeřábek et al. (2004).

Type of delimitation		Criterion and characteristics
Objective	Administrative	Delimitation based on administrative subdivision (municipalities, district along the border, Euroregion in EU). Practical delimitation due to data availability.
	Geometric/distances perspective	Delimitation based on the distance from the border area, often using the administrative criterion. a) 15 km – definition of the borderland for the purpose of questionnaire surveys b) 20 km – zone defined on the basis of national legislation c) 25 km – definition in various international acts upon adoption of bilateral agreements on the regulation of cross-border movement of goods and people
	Historical	Delimitation based on common historical development features (e.g. relict boundaries – now non-existent).
	Cultural/ethnic dimension	Delimitation of the borderland as a culturally or ethnically homogenous area (usually according to share of ethnic minorities).
	Political and economic	For example delimitation based on EU requirements on the possibility of drawing support for the borderland (borderland as territory with population of 1 million and more).
	Physical-geographical aspect	Definition based on delimitation by natural barriers (e.g. mountains). This aspect is currently receding into the background due to technical progress.
Subjective	Perceptual dimension	Delimitation based on a subjective identification of people with the borderland. This approach emphasizes “bottom-up” delimitation (useful especially in identifying and building the identity of the borderland).

of population transformations in border areas on the Polish side. The greatest interest in the southern part of the Silesian Voivodeship was demonstrated in the 1970s and 1980s, which underlines the lack of contemporary literary resources (Spórna 2012). The issues related to the border, on the other hand, were mainly undertaken in the 1990s and in the early twenty-first century, when the works of authors such as Borsa et al. (1997), Borsa and Królikowski (1997), Havrlant (1996), Heffner (1996, 1998), Kłosowski and Runge (2000), Kłosowski et al. (1996), Kłosowski et al. (2002), Prawelska-Szypek and Domański (1997), Runge (2001), Runge and Kłosowski (2001), Siwek (1997), Zygadlewicz and Koczurek (1994) were published.

## RESEARCH METHODS

The study uses research methods commonly used in socio-economic geography; however, two of them require a brief explanation. In order to illustrate the relationship between natural increase and natural loss and net migration, Webb's (1963) procedure was applied. It allows one to identify the dominant component of the natural increase/decrease of population in a specific section or interval of time. Depending on the domination of natural increase/decrease and net migration (positive, negative), there are eight possible types of relationships between these variables, marked with letters from A to H. In this work, they are described with the presentation of results.



Note: Axes of coefficients N – inflow, O – outflow, S – net migration, M – mobility,  $\bar{x}$  – average values.

**Figure 1** Graphic representation of Długosz's typograph method. Source: Długosz (1992:27).

The second research method applied was the method proposed by Długosz (1992), by which an attempt of typology of cities was made. The basis of Długosz's typograph method is a division of the research population, in this case the cities of the area under study, according to the distribution of the four basic parameters of population migration in relation to average values:

“The typograph itself is a graphic expression of distribution of the studied traits in relation to the average values. Its design is based on a system of calibrated horizontal axes that illustrate the values of the following coefficients: inflow (N), outflow (O), net migration (S) and mobility (M), crossed with a vertical axis ( $\bar{x}$ ) in the average values of these indicators. Once the values of the various coefficients are entered on the axes, a broken line (graph) is created. The mutual relationship of the two lines, the straight line (average values) and the broken line (graph), is the basis of the distribution of the studied population into types, and a graphic image of these types is called a typograph (Figure 1)” (Długosz 1992:27).

Using four variables, it is theoretically possible to obtain 16 different types, but in practice, only 12 types are real. In this study, the average values ( $\bar{x}$ ) were assumed as average coefficients for all the

cities of the Polish-Czech borderland for the years 2000–2013. The principle was abandoned for the ratio of net migration, for which the average was set at 0‰, which resulted in a division into units of positive and negative net migration. One disadvantage of this method is that the adoption of average values for a longer period averages the image of the phenomenon, whereas its undoubted advantage is the avoidance of accidental, random swings of coefficients in particular years, and accuracy in capturing relevant trends in the studied process.

### CHARACTERISTICS OF THE AREA UNDER STUDY AND HISTORICAL BACKGROUND

The area under study comprises seven land counties and four city counties on the Polish side and six districts on the Czech side (Figure 2). The specified part of the Silesian Voivodeship occupies less space than the Moravian-Silesian Region, but it is inhabited by more people and, therefore, it is characterized by a higher population density (Table 2).

The areas on both sides of the border are characterized by a much higher population density than the national average (the Moravian-Silesian Region: 225 people per km<sup>2</sup> compared to 133 in the Czech Republic; a fragment of the Silesian Voivodeship: 338 people per km<sup>2</sup> compared to 122 in Poland). On the Polish side, the highest population density

**Table 2** Characteristics of districts in 2013. Source: data from the Polish Local Data Bank by Central Statistical Office and the Czech Statistical Office; own processing.

No.	County/District	Area (km <sup>2</sup> )	Population (thous.)	Population density (inhab./km <sup>2</sup> )	Urban population	Urbanization rate (%)
<b>Polish side</b>						
1	Bielsko-Biala	459	160.4	349	44,449	27.7
2	Bielsko-Biala city county	125	173.7	1,390	173,699	100.0
3	Cieszyn	730	177.5	243	81,565	46.0
4	Jastrzębie-Zdrój city county	85	91.2	1,073	91,235	100.0
5	Pszczyna	471	108.9	231	25,999	23.9
6	Racibórz	544	109.6	201	63,625	58.1
7	Rybnik	224	76.9	343	28,481	37.0
8	Rybnik city county	148	140.2	947	140,173	100.0
9	Wodzisław Śląski	287	157.8	550	102,814	65.2
10	Żory city county	65	62.0	954	62,038	100.0
11	Żywiec	1,041	153.1	147	32,083	21.0
	Total	4,178	1,411.3	338	846,161	60.0
<b>Czech side</b>						
1	Bruntál	1,536	95.2	62	65,168	68.5
2	Frýdek-Místek	1,208	212.5	176	116,554	54.8
3	Karviná	356	258.3	725	224,311	86.8
4	Nový Jičín	882	151.9	172	99,695	65.6
5	Opava	1,113	177.0	159	97,130	54.9
6	Ostrava-město	332	326.9	986	313,274	95.8
	Total	5,427	1,221.8	225	916,132	75.0

is observed in the city counties of Bielsko-Biala and Jastrzębie-Zdrój, with the lowest in the Żywiec district. On the Czech side, on the other hand, the most densely populated place is Ostrava-město, and the lowest population density is observed in the district of Bruntál.

In the area of the Moravian-Silesian Region, there are 42 cities and towns, which are inhabited by a total of 916,000 people, which accounts for an urbanization rate of 75%. Due to this fact, the region is among those with the highest percentage of the urban population in the Czech Republic. In the studied area of the Silesian Voivodeship, however, there are only 22 cities and towns inhabited

by 846,000 people. The urbanization rate is 60%, which is less than in the entire Silesian Voivodeship, and even below the average value of this coefficient in Poland. The population density on the Czech side is much less diversified than on the Polish side. The urbanization rate for four Polish districts is 100%, since these are city counties.

The largest city and the capital of the Moravian-Silesian Region is Ostrava, with a population of about 300,000. There are 11 medium-sized towns with over 20,000 residents: Bohumín, Český Těšín, Frýdek-Místek, Havířov, Karviná, Kopřivnice, Krnov, Nový Jičín, Opava, Orlová and Třinec. Other towns are small, among which, the smallest



Figure 2 Cities and towns of the area under study. Source: own processing.

ones are with populations of between 300–400 residents (Janov and Andělská Hora). In the settlement structure on the Polish side, two large sub-regional centres stand out: Bielsko-Biala and Rybnik, accounting for 174,000 and 140,000 inhabitants, respectively. Medium-sized towns include: Jastrzębie-Zdrój, Żory, Racibórz, Wodzisław Śląski, Cieszyn, Czechowice-Dziedzice, Żywiec, Czerwionka-Leszczyny, Pszczyna and Rydułtowy, with population varying from 22,000 to 91,000 residents. There are 10 small towns, and their population varies from 2,200 (Krzanowice) to 18,000 (Radlin). Such size brackets of towns, in terms of population, indicate a very broad diversity of these units.

Making a generalization, it may be said that cities on both sides of the border accumulate approximately 1/3 of the urban population. About 50% of the urban population lives in medium-sized towns, and the rest are residents of small towns. The biggest differences refer to this last group. On the Polish side, the residents of small towns most often live in towns with a population of 10,000–20,000, whereas on the Czech side in towns with a population 5,000–10,000.

For such a specific area of research, the historical background of population transformations is crucial. It is worthy to highlight the fact that the observed social and economic changes on both sides of the border were very similar in nature and were related to the dominant role of traditional industries such as coal mining, iron industry, energy industry or machinery industry. After 1945, the Ostrava-Karviná and the Rybnik regions transformed the scale of the Czech Republic and Poland into strategic economic areas (Runge 2003b). In the absence of sufficient labour force, immigration occurred as well as accompanying phenomenon of commuting.

A common feature of the analysed territory is the achievement of a relatively high level of economic development already in the period of the Austro-Hungarian Empire. In the nineteenth century, textile industry plants were built in Bielsko and mining-metallurgical plants were established in the Ostrava-Karviná Basin (Kłosowski and Runge 2001).

The area on the Czech side underwent a remarkable population growth resulting from early industrialization, reaching its maximum at the turn of the twentieth century and in the so-called socialist development of the Ostrava region after World War II. The result of this development was the migration of population. The largest urbanization processes took place in the Ostrava-Karviná region. A significant increase in population was recorded in the mining towns of Karviná and Orlová already in the 1920s and 1930s (Prokop 2001). In the 1950s, a completely new town of Havířov emerged and it was populated mostly by new immigrants from the hinterland (Kaňok and Siwek 2001). After 1950, a significant growth was recorded in Havířov, Frýdek-Místek and Český Těšín. Until 1998, population dynamics in Havířov amounted to as high as 730%, in Frýdek-Místek 280%, and in Český Těšín 214%. The urbanization was accompanied by great changes in demographic structures. Massive economic migration from all parts of the country consisting of mostly young people was of special importance. The main migration waves were directed at industrial centres and new housing developments. A significant development of border towns contributed to the stagnation of population, and, in extreme cases, to the depopulation of many rural settlements, especially in the mountainous areas of the southern part of Cieszyn Silesia (Prokop 2001). The current high rate of urbanization on the Czech side is the result of the post-war urban development of the towns around the Ostrava agglomeration as well as simultaneous rapid depopulation of rural areas (Kłosowski et al. 1997). After 1989, a difficult process of transformation began. The effect of the introduction of market economy, including the restructuring of industry in the 1990s was a significant outflow of population, including people with higher education, to Prague, Brno and other major cities of the Czech Republic (Prokop and Hejna 1998).

Almost twin transformations occurred on the Polish side, since the discovery of coal deposits in the 1950s led to rapid industrialization and influenced the development of the so-called Rybnik Coal Area (RCA). Intensive industrialization and urbanization was accompanied by dynamic demographic

transformations that took on an exceptional scale in the case of the cities of the Rybnik conurbation. Since the 1960s, intense migration inflow of the population took place, mostly men who found employment in the mining industry. With the inflow of labour force, there was a rapid development of mining towns and housing estates in their suburban areas (Spórna 2012). In the years 1950–1973, the growth rate of the population in Jastrzębie-Zdrój amounted to 4,127%, in Wodzisław Śląski to 588%, in Żory to 242%, in Rybnik to 227% (Krawczyk and Królikowski 1975). The shaping of the Bielsko-Biała agglomeration was fostered by the process of industrialization, especially the development of the textile and machinery industries.

## POPULATION TRANSFORMATIONS

The first element of the analysis of population transformations is the dynamics of population changes (Table 3). It shows that the border areas on the Polish side are clearly different in terms of trends of demographic changes. Overall, in the period 1995–2013, the population on the Polish side slightly increased. The highest dynamics of population was recorded in the districts of Bielsko-Biała, Cieszyn and Pszczyna. In contrast, the city of Jastrzębie-Zdrój, the district of Racibórz and Żory, through a substantial decline in population, contributed to a decrease in dynamics in the entire area. Quite a different tendency is observed on the Czech side, where the population decreased. Most regions contributed to decrease and only one (Frýdek-Místek) saw the population increase after 2005.

Despite the difference in the direction of population transformations at the scale of districts on the Polish and Czech sides, some similarities may be pointed out, with a more detailed depiction on the level of towns and rural areas (Figure 3).

On the Czech side, the dynamics of population increases with shifting from northwest to southeast. In the Bruntál district, there was a decrease in population in both urban and rural areas. Besides this case, generally, in most towns, there was a loss of population, with population growth occurring in

rural areas. The towns in close proximity to Ostrava showed a different tendency, namely an increase in the number of population. The biggest decrease of urban population is observed in major towns of the Karviná district.

Also, on the Polish side, in the western part, there is a district, where both urban and rural areas have lost inhabitants. It is the Racibórz district. In the cities of the southern part of the Silesian Voivodeship, population decreased, with its increase observed in small towns and rural areas. The dynamics of the population in these areas is clearly greater than in the immediate vicinity of the cities. The phenomenon of the loss of urban population is smaller than on the Czech side.

An important issue is how such trends of demographic transformations have affected the relationships between particular components of natural increase/decrease. In other words, the question arises as to which component is responsible for this state of affairs to a greater extent. The first is the natural increase, which is the difference between the number of births and deaths (Figure 4).

On the Czech side, natural decrease dominated in rural areas and the biggest one was observed in the Karviná district. One exception was the district of Nový Jičín, in which natural increase was recorded not only in rural areas, but also in most towns. The towns of the remaining parts of the region showed mostly natural decrease. On the Polish side, the situation in this aspect was much more diversified. The highest dynamics of population growth occurred in the district of Pszczyna and it decreased toward the south and west. The only district in which natural decrease took place was the Racibórz district. However, in the case of towns, natural decrease occurred in towns located more peripherally, i.e. to the south and southwest of Bielsko-Biała and west of Rybnik. The highest rate of growth was noticed in Żory and Jastrzębie-Zdrój.

The presented data suggest that in terms of natural increase, areas on both sides of the border clearly differ. Natural decrease is a component that has a significant impact on population transformations on the Czech side.

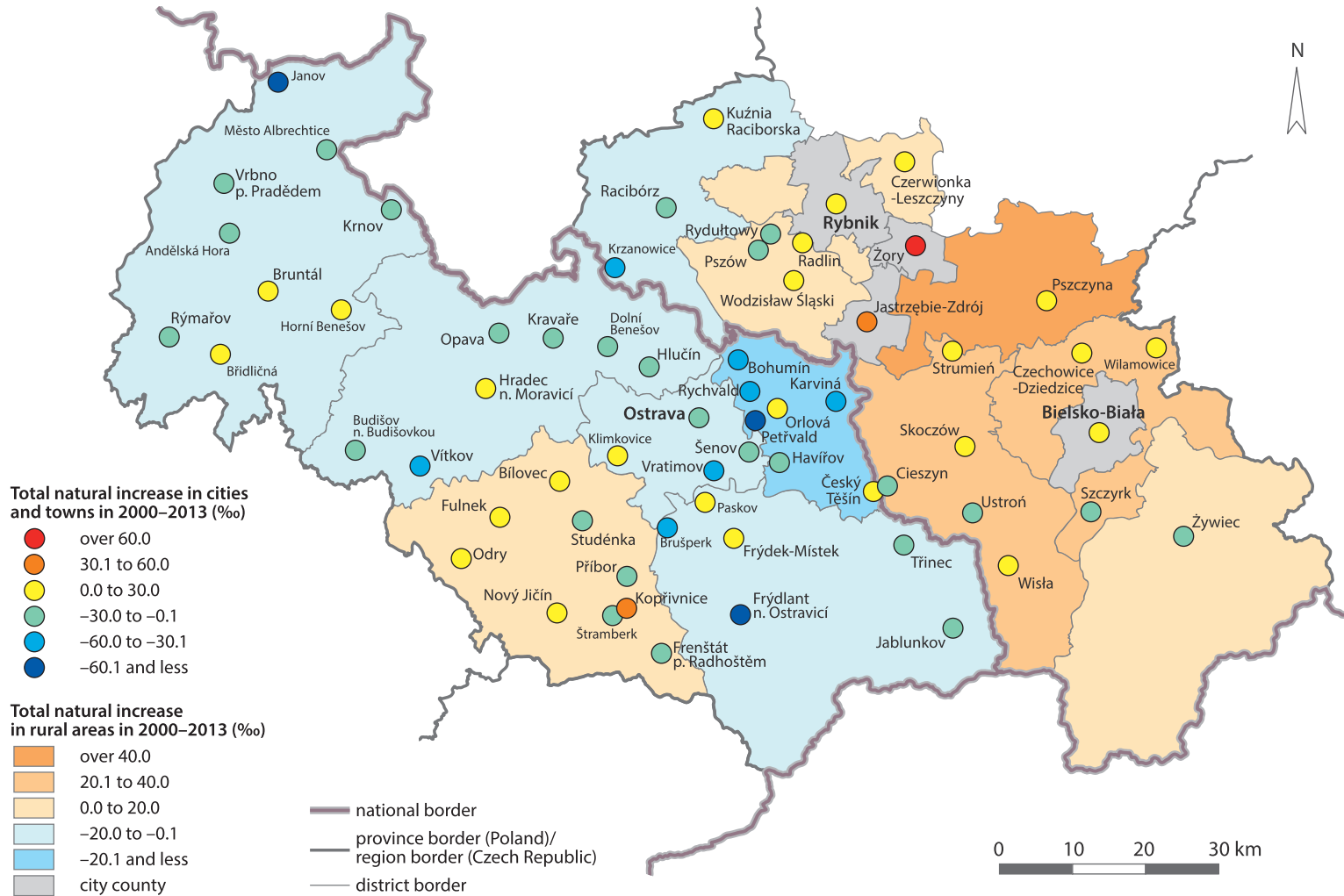


**Table 3** Dynamics of population changes in the districts of the Polish-Czech borderland in the years 1995–2013. Source: data from the Polish Local Data Bank by Central Statistical Office and the Czech Statistical Office; own processing.

No.	County/District	Population					Dynamics of changes (1995 = 100%)			
		1995	2000	2005	2010	2013	2000	2005	2010	2013
<b>Polish side</b>										
1	Bielsko-Biala	142,834	145,772	150,281	157,119	160,405	102.1	105.2	110.0	112.3
2	Bielsko-Biala city county	180,397	178,611	176,864	174,755	173,699	99.0	98.0	96.9	96.3
3	Cieszyn	168,167	168,729	170,91	175,966	177,479	100.3	101.6	104.6	105.5
5	Jastrzębie-Zdrój city county	103,309	97,537	95,482	92,622	91,235	94.4	92.4	89.7	88.3
5	Pszczyna	100,944	102,882	104,47	107,712	108,91	101.9	103.5	106.7	107.9
6	Racibórz	121,598	115,473	112,009	110,231	109,564	95.0	92.1	90.7	90.1
7	Rybnik	73,671	72,81	73,469	75,995	76,915	98.8	99.7	103.2	104.4
8	Rybnik city county	144,578	143,218	141,58	141,036	140,173	99.1	97.9	97.6	97.1
9	Wodzisław Śląski	158,324	155,458	155,17	158,242	157,787	98.2	98.0	99.9	99.7
10	Żory city county	66,219	63,533	62,849	62,138	62,038	95.9	94.9	93.8	93.7
11	Żywiec	149,159	148,675	149,467	152,972	153,108	99.7	100.2	102.6	102.6
	Total	1,409,200	1,392,698	1,392,551	1,408,788	1,411,313	98.8	98.8	100.0	100.1
<b>Czech side</b>										
1	Bruntál	101,131	100,598	98,543	97,369	95,172	99.5	97.4	96.3	94.1
2	Frýdek-Místek	211,683	210,638	209,326	212,111	212,537	99.5	98.9	100.2	100.4
3	Karviná	287,337	283,317	276,661	270,412	258,341	98.6	96.3	94.1	89.9
4	Nový Jičín	154,156	154,006	151,835	152,524	151,899	99.9	98.5	98.9	98.5
5	Opava	178,683	177,94	176,653	177,236	177,011	99.6	98.9	99.2	99.1
6	Ostrava-město	351,492	347,038	337,752	333,579	326,874	98.7	96.1	94.9	93.0
	Total	1,284,482	1,273,537	1,250,769	1,243,220	1,221,832	99.1	97.4	96.8	95.1



**Figure 3** Dynamics of urban and rural population of the Polish-Czech borderland. Source: data from the Polish Local Data Bank of the Central Statistical Office and the Czech Statistical Office; own processing.



**Figure 4** Natural increase in urban and rural areas of the Polish-Czech borderland. Source: own work based on data from the Polish Local Data Bank of the Central Statistical Office and the Czech Statistical Office.



**Figure 5** Net migration in cities, towns and rural areas of area under study. Source: data from the Polish Local Data Bank of the Central Statistical Office and the Czech Statistical Office; own processing.

The second component of the change in population is net migration (Figure 5). In the case of the Czech side, as was the case with the dynamics of the population, an increase in net migration is visible from northwest to southeast. The most peripheral region of Bruntál is characterized by negative values of net migration in both urban and rural areas. In the central part (Nový Jičín and Opava) rural areas are characterized by migration inflow, and most towns by emigration trends. The highest values of net migration are recorded in rural areas in the eastern part of the area, while the major cities and towns (Ostrava, Karviná, Havířov, Frýdek-Místek) record a significant loss of migratory population. In towns around Ostrava and in rural areas, an increase in migration is dominant. Similar trends, but not so dynamic, take place on the Polish side. Almost all towns, with the exception of three in the vicinity of Bielsko-Biala, recorded negative values of net migration. On the contrary, rural areas, with the exception of the already pointed out Racibórz district, were characterized by an increase in values of net migration, the largest in the surroundings of Bielsko-Biala.

#### **RELATIONS BETWEEN NATURAL CHANGE AND MIGRATION – THE APPLICATION OF WEBB’S PROCEDURE**

The application of Webb’s procedure allows a systematization of the hitherto considerations and it helps determine the relationship between natural change and migration of the population (Figure 6). On this basis, towns were divided into six types. Types C and D are towns in which the population increased. Type C occurs when positive net migration exceeds the natural increase, and in type D, positive net migration exceeds the natural decrease. In both cases, net migration has the biggest role in the demographic development of the area. Other towns (types E, F, G and H) recorded a decline in population. Type E includes towns in which the natural decrease is not compensated by a migrational increase. Type F is the one in which natural decrease takes place and is amplified by a migrational loss. The most numerous was type G, which included towns with migrational decrease enhanced by natural loss. The final type H consists

of towns in which migrational decrease is higher than the natural increase. In types C, D, G and H, it is migration that has the greatest influence on the shaping of the actual growth or loss of population.

In most towns and cities in the Polish-Czech borderland, the population is decreasing and the deciding factor is the negative net migration, which is more important than the natural change. Only areas surrounding Ostrava and Bielsko-Biala stand out in this aspect. In both cases, the towns located in their proximity are characterized by an actual increase.

In the case of rural areas, four types were distinguished, with population increasing in three of them (types A, C, D). Type A occurs when in a given area the migrational loss is compensated by natural increase. The more frequently occurring types C and D indicate that the demographic development of an area is mainly caused by positive net migration. The opposite situation takes place in rural westernmost located areas, on both sides of the border, which are depopulating. They are classified as type G, where negative net migration is amplified by natural loss.

The applied method allowed to point out that net migration is crucial both for urban and rural areas of the Polish-Czech borderland, but the direction of changes differs. In the vast majority of towns and cities the population is decreasing, whereas in rural areas it is increasing, with the exception of areas located in the western part of the area under study.

#### **TYOLOGY OF CITIES AND TOWNS ACCORDING TO DŁUGOSZ’S METHOD**

The last phase of the analysis is an attempt to make a typology of towns and cities of the Polish-Czech borderland with the application of Długosz’s method (1992), the results of which are shown in Table 4. From the point of view of the net migration coefficient, it allowed for the division of cities and towns into two main groups, namely immigration and emigration types. Immigration types have




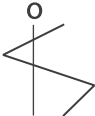
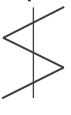
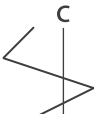

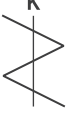
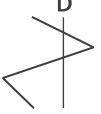

**Figure 6** Cities, towns and rural areas of the Polish-Czech borderland according to Webb's typology. Source: data from the Polish Local Data Bank of the Central Statistical Office and the Czech Statistical Office; own processing.



**Figure 7** Towns and cities of the Polish-Czech borderland according to Dlugosz's method. Source: data from the Polish Local Data Bank of the Central Statistical Office and the Czech Statistical Office; own processing.

**Table 4** Typology of the towns and cities of the Polish-Czech borderland in the years 2000–2013.

Source: Dlugosz, 1992; data from the Polish Local Data Bank by Central Statistical Office and the Czech Statistical Office; own processing.

Type	Type description	Graphic representation	Cities and towns
Immigration	L Highly mobile		Frýdlant nad Ostravicí, Paskov, Petřvald, Rychvald, Šenov, Štramberk, Vratimov
	O Mobile pulling		Brušperk, Hlučín, Hradec nad Moravicí, Klimkovice
	F Settled pulling		Kravaře
	C Highly settled		Szczyrk, Wilamowice, Ustroń
Emigration	N Highly mobile		Andělská Hora, Bílovec, Břidličná, Bruntál, Frenštát pod Radhoštěm, Horní Benešov, Jablunkov, Janov, Město Albrechtice, Nový Jičín, Orlová, Příbor; Strumieň
	K Mobile pushing		Budišov nad Budišovkou, Český Těšín, Frýdek-Místek, Havířov, Koprivnice, Vítkov
	D Settled pushing		Karviná, Studénka, Vrbno pod Pradědem
	A Highly settled		Bohumín, Dolní Benešov, Fulnek, Krnov, Odry, Opava, Ostrava, Rýmařov, Třinec; Czechowice-Dziedzice, Cieszyn, Wisła, Skoczów, Żywiec, Bielsko-Biala, Racibórz, Krzanowice, Kuźnia Raciborska, Czerwionka-Leszczyny, Pszów, Radlín, Rydułtowy, Wodzisław Śląski, Jastrzębie-Zdrój, Rybnik, Żory, Pszczyna



a positive net migration of the population while emigration types are characterized by a negative net migration. On the basis of the relationship of the remaining three parameters to average values, a further division was made. In this way, a total of eight types was achieved: four immigration types and four emigration types.

The vast majority of towns and cities in the area, 49 out of the total number of 65, were included into the emigration type (Figure 7). A highly mobile type (N) is characterized by the fact that the inflow, outflow and mobility are above average. Most such cities and towns are located in the district of Bruntál, and on the Polish side, Strumień is an example of such a town. The mobile pushing type (K) is characterized by high mobility, which is caused by higher than average emigration, with lower immigration. In the settled pushing type (D), low mobility is the result of a lower than average immigration, and of a lower emigration. Many towns and cities of the area represent a highly settled type (A), in which the inflow and outflow are below average and therefore also mobility is below average. This type includes larger towns and cities like Ostrava and Opava on the Czech side, and most of the towns and cities on the Polish side.

Only fifteen towns and cities in the studied area are centres which fall into the immigration type. A highly mobile type (L) is characterized by an above average inflow, outflow and mobility index, therefore, these are the centres with high dynamics of changes. Towns located in close proximity to Ostrava, on its western side, are characterized by high mobility due to a higher than average immigration, and a lower emigration, so this is the mobile pulling type (O). The town of Kravaře is the only example of the settled pulling type (F), which is characterized by low mobility due to a lower than average emigration, with higher immigration. The only centres on the Polish side that represent the immigration type include Szczyrk, Wilamowice and Ustroń. They were identified as type (C), which is highly settled, in which the parameters of the inflow, outflow and mobility are below average.

The applied typology allowed to identify towns and cities located on both sides of the border which stand out in the dynamics of transformations. Definitely, the dynamics of demographic transformations on the Polish side is much less intense. Among emigration towns, only Strumień represents a highly mobile type, whereas the remaining Polish towns, compared to the Czech ones, are highly settled.

A much higher diversification of types is present in the case of towns and cities on the Czech side. First and foremost, the surroundings of Ostrava are prominent, with the presence of several highly mobile and mobile pulling towns.

## CONCLUSION

Settlement structures on both sides of the Polish-Czech border differ quite significantly and on this basis it can be concluded that population transformations will take a particular course. This is supported by a diverse direction of population transformations in the whole area, since population growth was recorded on the Polish side, whereas decrease was observed on the Czech side. Therefore, it might seem that the areas of the Polish-Czech borderland are very different, but the use of research methods and a more detailed analysis, allowed identifying a number of similarities.

The first similarity of transformations that draws one's attention is the fact that in general, a demographic regress of towns is observed on both sides of the border with a simultaneous development of the rural population. The natural increase is responsible for this to some extent. The actual movement component, which is critical for the population development of areas in this case, is the net migration. This is confirmed by the applied method by Webb.

The greatest loss of population concerns towns and cities, which in the past, including the 1960s and 1970s, were the main growth centres. Due to the historical background, mono-functionality of centres might be of great importance. In the case of such areas, outflow of migration beyond the region is observed, which is connected with people returning to their homeland once they have retired. In addition,

the decrease of the urban Czech population may be a result of the remoteness of these places in relation to Prague, which, as the capital of the country, has a strong impact on the remaining territory. Comparing the dynamics of migration transformations in cities and towns on both sides of the border, it must be highlighted that mobility on the Czech side is much higher. On the contrary, Polish towns and cities have a high degree of settling.

A common denominator for the areas of the Polish-Czech borderland is rural development, particularly in the vicinity of larger towns and cities. Suburbanization is, in this case, a stagnation factor or even factor of regression of cities in terms of population. In rural areas, population is increasing and they attract people from highly urbanized areas. This process is presently observed in the vicinity of Bielsko-Biala and Ostrava.

The population is increasing in small and medium-sized towns in the vicinity of Bielsko-Biala. The surroundings of Ostrava, with the development of the towns of Klimkovice, Šenov, and Vratimov, also constitute a growth area. In these cases, the impact zone of a city is a growth factor. This is a consequence of the fact that people's preferences have changed in reference to the place of residence – today it is desirable to have a single-family house in a quiet location in an attractive landscape setting, yet relatively close to the city to be able to commute to work and use urban services. Such conditions are met in the surroundings of major cities of the area in which the process of suburbanization is observed. For this reason, current research on the Bielsko-Biala area is focused on this process (Olberk-Żyła 2013).

A common feature for the Polish-Czech borderland is also the presence of districts in which depopulation concerns both urban and rural areas. These are the westernmost districts of Bruntál and Racibórz located peripherally towards the most important development centres.

To sum up, the phenomena that are observed in the Polish-Czech borderland are typical for areas characteristic for advanced urban processes.

Contemporary demographic processes in many countries take on a polarizing character. A concentration of population in areas with a higher level of social and economic development, the sprawl of urban population to the neighbouring rural areas as a result of the suburbanization process or chaotic urban sprawl are observed simultaneously. On the other hand, a depopulation of peripheral areas is taking place, affecting particularly rural areas located far away from big cities (Miszczuk 2013).

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## Résumé

### Demografické a sociální transformace východní části polsko-českého pohraničí

Hlavním cílem článku je zhodnocení diverzity trendů transformace populačního vývoje ve městech východní části polsko-českého pohraničí a komparace těchto trendů s trendy transformace populačního vývoje v zázemí těchto měst. Příspěvek hodnotí vzájemné vztahy mezi populačním vývojem měst a jejich zázemí v kontextu populačního vývoje obou stran hranice, přičemž obě dvě strany hranice jsou podrobeny srovnání.

Zájmovým územím provedené analýzy je jednak Moravskoslezský kraj na české straně, jednak jižní část Slezského vojvodství na polské straně. Jako datová základna analýzy byl využit statistický materiál publikovaný Českým statistickým úřadem a Centrálním statistickým úřadem Polska. Na základě těchto dat byl analyzován celkový přírůstek/úbytek obyvatel v období 2000–2013. S ohledem na dosažení vymezeného cíle byly použity dvě výzkumné metody: Webbova typologie a Długoszova typologie. První i druhá metoda odhalují vztah mezi přirozeným přírůstkem obyvatel a migračním saldem obyvatel, přičemž druhá metoda využívá i průměrných

hodnot dílčích složek (přistěhovalí, vystěhovalí, saldo migrace, mobilita) migrační dynamiky. S využitím těchto metod byla vytvořena typologie hodnocených měst.

Použitá analýza odhalila v obecné rovině na obou stranách hranice dva odlišné trendy populačního vývoje. Jestliže populace na české straně zájmového území klesala, na polské straně populace hodnoceného regionu rostla. Pokud srovnáme vývoj v městech a jejich zázemích, zjistíme, že situace na obou stranách hranice je obdobná. Dochází ke snižování počtu obyvatel měst, oproti tomu je možné v rámci celého zájmového území pozorovat zvyšování počtu obyvatel v zázemí těchto měst. Tento trend je determinován především kladnými hodnotami prostorové mobility v zázemích měst, v menší míře se zde pozitivně uplatňuje taktéž přirozený pohyb obyvatel.

Největší populační ztráty vykazují v průběhu sledovaného období města, která naopak byla v minulosti (především 60. a 70. léta dvacátého století) hlavními centry populačního růstu, a to v důsledku rozvoje průmyslu. Venkovské regiony situované v bezprostřední blízkosti větších měst naopak zaznamenaly na obou stranách hranice výraznější populační přírůstky. Tyto regiony zřejmě přitahovaly obyvatele z vysoce urbanizovaných území. Skutečnost lze dát do souvislosti s procesem suburbanizace probíhající v současnosti, který je přítomný v zázemí měst Ostravy a Bielsko-Biala. Především v zázemích velkých měst jsou pak populační zisky spojeny také s městy malé a střední velikosti, což je patrné především v případě Ostravy a jejího zázemí.

Pokud srovnáme dynamiku vývoje migrací ve městech na obou stranách hranice, zjistíme, že je možné rozlišit čtyři emigrační a taktéž čtyři imigrační typy. Naprostá většina měst přísluší do emigračních typů, přičemž na české straně zájmového území byla v případě měst zjištěna mnohem vyšší mobilita. V případě českých měst byla taktéž zjištěna větší diverzita jednotlivých typů použité typologie.

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