

Chapter IV

THE OUTER METROPOLITAN ZONE AS THE AREA OF IMPACT OF SHOPPING MALLS IN SILESIA VOIVODESHIP

1. Location and impact areas of shopping malls in the Silesian Voivodeship

According to public statistics, there are 96 hypermarkets³², 617 supermarkets³³, 7 department stores³⁴ and 28 trade stores³⁵ within the Silesian Voivodeship (as at the end of 2011). Most hypermarkets operate in Katowice (20), Rybnik (15), and Sosnowiec sub-regions (14), and they are least numerous in the sub-regions of Tychy (7), Częstochowa (8), and Gliwice (9). The majority of supermarkets are located in Rybnik (11), Katowice (103), and Bielsko-Biała sub-region, and they are least present in the sub-regions of Tychy (45), Częstochowa (46), and Bytom (58). Department stores can be found in Katowice (3) sub-region and there is also one department store in each of the following sub-regions: Częstochowa, Gliwice, Rybnik and Sosnowiec. Trade stores are most numerous in the sub-regions of Bielsko-Biała (6), Częstochowa and Katowice (4), and least numerous in Bytom (1) and Gliwice (2) sub-region.

From among cities with powiat rights, the most numerous hypermarkets are located in Katowice (9), Bielsko-Biała (8), and Bytom, Częstochowa, Rybnik and

³² *Hypermarket* is a store with sales area of at least 2500 m² that conducts sales mainly within a self-service system, offering a large range of groceries and other frequently purchased products, usually with a car park (source:) http://www.stat.gov.pl/gus/definicje_PLK_HTML.htm?id=POJ-3295.htm.

³³ *Supermarket* is a store with sales area from 400 m² to 2499 m² that conducts sales mainly within a self-service system, offering a large range of groceries and other frequently purchased products [source:] http://www.stat.gov.pl/gus/definicje_PLK_HTML.htm?id=POJ-3296.htm.

³⁴ *Department store* is a multi-department store with the total area of sale premises of 2000 m² and more, offering broad and versatile range of non-grocery goods, and often also groceries: it may also conduct a supplementary catering and service activities [source] http://www.stat.gov.pl/gus/definicje_PLK_HTML.htm?id=POJ-5887.htm.

³⁵ *Trade store* is a multi-department store (with at least two specialised departments) with the total area of sale premises from 600 m² to 1999 m², conducting sales of products within a similar range as in the case of department store [source:] http://www.stat.gov.pl/gus/definicje_PLK_HTML.htm?id=POJ-5886.htm.

Zabrze (6 in each of them). Supermarkets are most numerous in Katowice (40), Gliwice (35), and Bielsko-Biała (33). The most of trade stores are localised in Katowice, Częstochowa, and Tychy (three in each of them). In addition, also in Katowice, there are most, for as many as 3, department stores, which also (from among cities with powiat rights) were also located in Częstochowa and Zabrze (Tab. 9).

Hypermarkets were mostly located in such poviats as Będzin and Tarnowskie Góry (4 of them in each), and Cieszyn and Racibórz (2 in each). Supermarkets can be found in the following poviats: Wodzisław (28), Cieszyn (25), and Racibórz (21). Trade stores in 2011 were most numerous in the poviats of Bielsko-Biała and Żywiec (2 in each), and trade stores in Wodzisław and Będzin poviats.

Playing the role of a specific core of shopping malls, hypermarkets³⁶ are most often located in places which are very well accessible (also in terms of road transport)³⁷. This factor may be taken into account in determining the possible area of influence of a mall (given the additional assumption that accessibility translates into the rank of the shopping mall). In the examination of the range of influence of 33 shopping malls, located in 18 cities of the Silesian Voivodeship (Tab. 10), a road map was used in split into 14 categories (whereby category 1 means highways, Fig. 10 – coloured insert, p. 1), and the following assumptions were adopted as regards the speed of travel on them: (a) highway – 100 km, (b) expressway – 80 km, (c) dual carriageway – 60 km, (d) single carriageway – 50 km, (e) other – 30 km, (f) unmade road – 20 km, (g) other municipal road – 20 km. This map served as a basis for calculation of space resistance. On that basis, a fractal map of drive times to selected shopping malls was prepared (Fig. 11 – coloured insert, p. 1). The map of drive times was also used to generate a map of impact breakdown of individual shopping malls. The delimitation conducted is based on the assumptions relating to the time of drive from the place of residence to the shopping centre (Fig. 12 – coloured insert, p. 2).

From among the selected shopping malls, the most important one in the Silesian Voivodeship is CH Silesia City Center, a shopping mall located in Katowice and aspiring to become a centre of national importance (hypothetical impact area 12,369.81 km²). Of slightly lesser importance are sub-regional shopping malls located in:

- Bielsko-Biała: CH Sfera (hypothetical impact area of 3,888.91 km²),
- Częstochowa: Galeria Jurajska (hypothetical impact area of 3,888.91 km²),
- Rybnik: CH Rybnik Plaza (hypothetical impact area of 3,101.85 km²),

From among remaining 29 shopping malls (of which 9 are located in city suburbs and 20 in city centres) of supra-local significance, the most important centres are:

- CH Promenada (a mall located in the suburbs of Częstochowa, with hypothetical impact area of 2,114.30 km²),

³⁶ See classification of shopping centres presented on pp. 24-26.

³⁷ The importance of a convenient and fast connection with a shopping mall has been highlighted many a time (see *i.a.* pp. 24-25, 27-28, 35-36).

Table 9

Number of large-format commercial facilities
located in poviats of the Silesian Voivodeship – as at 12.2011

Poviats	Hypermarkets	Supermarkets	Department stores	Trade stores
Będzin	4	20	1	0
Bielsko-Biała	0	17	0	2
Bieruń and Łędziny	0	10	0	1
Cieszyn	2	25	0	1
Częstochowa	1	3	0	1
Gliwice	0	18	0	0
Kłobuck	0	6	0	0
Lubliniec	1	8	0	0
Bielsko-Biała (with city rights)	8	33	0	1
Bytom (with city rights)	6	22	0	1
Chorzów (with city rights)	4	12	0	0
Częstochowa (with city rights)	6	28	1	3
Dąbrowa Górnicza (with city rights)	4	15	0	0
Gliwice (with city rights)	3	35	0	1
Jastrzębie-Zdrój (with city rights)	3	16	0	1
Jaworzno (with city rights)	0	8	0	1
Katowice (with city rights)	9	40	3	3
Mysłowice (with city rights)	2	8	0	0
Piekary Śląskie (with city rights)	1	9	0	0
Ruda Śląska (with city rights)	2	21	0	1
Rybnik (with city rights)	6	27	0	1
Siemianowice Śląskie (with city rights)	2	13	0	0
Sosnowiec (with city rights)	5	29	0	2
Świętochłowice (with city rights)	1	9	0	0
Tychy (with city rights)	5	10	0	3
Zabrze (with city rights)	6	24	1	1
Żory (with city rights)	3	12	0	0
Mikołów	1	11	0	1
Myszków	1	9	0	0
Pszczyna	1	14	0	0
Racibórz	2	21	0	1
Rybnik	0	6	0	0
Tarnowskie Góry	4	19	0	0
Wodzisław	1	28	1	0
Zawiercie	1	16	0	0
Żywiec	1	15	0	2

Source: [Local Data Bank, www.stat.gov.pl].

Table 10

Shopping malls located in the Silesian Voivodeship – as at 12.2011

Name	General location	Detailed location	Street
CH Sarni Stok	Bielsko-Biała	centre	Sarni Stok
CH Sfera	Bielsko-Biała	centre	Mostowa
Gemini Park	Bielsko-Biała	centre	Leszczyńska
Agora	Bytom	centre	Tadeusza Kościuszki Square
CH M1 Bytom	Bytom	suburbs	Strzelców Bytomskich
CH Plejada	Bytom	suburbs	Jana Nowaka-Jeziorańskiego Av.
CH Aks	Chorzów	centre	Parkowa
M1	Czeladź	centre	Będzińska
CH Promenada	Częstochowa	suburbs	Kiedrzyńska
Galeria Jurajska	Częstochowa	centre	Wojska Polskiego Av.
M1	Częstochowa	suburbs	Stefana Kisielewskiego
CH Pogoria	Dąbrowa Górnicza	centre	Jana III Sobieskiego
CH Arena	Gliwice	centre	Jana Nowaka-Jeziorańskiego Av.
CH Forum	Gliwice	centre	Lipowa
Galeria Jastrzębie-Zdrój	Jastrzębie-Zdrój	centre	Warszawska
CH Dąbrówka	Katowice	centre	Walentego Roździeńskiego Av.
CH Silesia City Center	Katowice	centre	Chorzowska
CH Trzy Stawy	Katowice	centre	gen. Kazimierza Pułaskiego
Auchan	Katowice	centre	Nikodema i Józefa Renców Rt.
Auchan	Mikołów	suburbs	Gliwicka
Ruda Śląska Plaza	Ruda Śląska	centre	1 Maja
CH Rybnik Plaza	Rybnik	centre	Raciborska
Focus Mail	Rybnik	centre	Bolesława Chrobrego
CH Echo	Siemianowice Śląskie	centre	Władysława Jagiełły
CH Plejada	Sosnowiec	centre	Stanisława Staszica
Fashion Hause Outlet Centre	Sosnowiec	suburbs	Orląt Lwowskich
Sosnowiec Plaza	Sosnowiec	centre	Henryka Sienkiewicza
Auchan	Sosnowiec	suburbs	Zuzanny
CH Echo	Świętochłowice	centre	Chorzowska
City Point	Tychy	centre	Aleja Jana Pawła II
CH Platan	Zabrze	centre	Plac Teatralny
M1	Zabrze	suburbs	Ryszarda Szukbczacza
Auchan	Żory	suburbs	Francuska

Source: Own work based on GoogleMaps.

Table 11

Shopping malls located in the Silesian Voivodeship – as at 12.2011

Name	Commune	Impact	Hypothetical area of impact (in km ²)*
CH Sarni Stok	Bielsko-Biała	supra-local	826.89
CH Sfera	Bielsko-Biała	sub-regional	3,888.91
Gemini Park	Bielsko-Biała	supra-local	1,293.08
Agora	Bytom	supra-local	709.48
CH M1 Bytom	Bytom	supra-local	0.32
CH Plejada	Bytom	supra-local	90.23
CH Aks	Chorzów	supra-local	14.84
M1	Czeladź	supra-local	194.32
CH Promenada	Częstochowa	supra-local	2,114.30
Galeria Jurajska	Częstochowa	sub-regional	5,379.05
M1	Częstochowa	supra-local	1,401.74
CH Pogoria	Dąbrowa Górnicza	supra-local	1,473.05
CH Arena	Gliwice	supra-local	735.07
CH Forum	Gliwice	supra-local	266.50
Galeria Jastrzębie-Zdrój	Jastrzębie-Zdrój	supra-local	651.72
CH Dąbrówka	Katowice	supra-local	26.25
CH Silesia City Center	Katowice	regional	12,369.81
CH Trzy Stawy	Katowice	supra-local	76.60
Auchan	Katowice	supra-local	21.41
Auchan	Mikolów	supra-local	266.47
Ruda Śląska Plaza	Ruda Śląska	supra-local	95.73
CH Rybnik Plaza	Rybnik	sub-regional	3,101.85
Focus Mail	Rybnik	supra-local	224.75
CH Echo	Siemianowice Śląskie	supra-local	40.83
CH Plejada	Sosnowiec	supra-local	19.05
Fashion Hause Outlet Centre	Sosnowiec	supra-local	329.00
Sosnowiec Plaza	Sosnowiec	supra-local	21.01
Auchan	Sosnowiec	supra-local	0.19
CH Echo	Świętochłowice	supra-local	26.83
City Point	Tychy	supra-local	374.16
CH Platan	Zabrze	supra-local	78.19
M1	Zabrze	supra-local	14.29
Auchan	Żory	supra-local	0.21

* Hypothetical impact area was calculated on the basis of a raster map with resolution of 1000x1000 cells. The area of Silesian Voivodeship totals 12,369.81 km² on that map (the official area of the voivodeship is 12,333.09 km²). The difference stems from the resolution of the raster map.

Source: Own calculation.

- CH Pogoria (a store located in the centre of Dąbrowa Górnicza, with hypothetical impact area of 1,473.05 km²),
- M1 in Częstochowa (a shopping mall with a hypothetical impact area of 1,401.74 km²),
- Gemini Park (a store located in the centre of Bielsko-Biała, with hypothetical impact area of 1,293.08 km²).

From among shopping malls selected for the analysis, only two were located in medium-sized towns (Czeladź and Mikołów), while the remaining ones are located in large cities. It should be stressed here that shopping malls located in the two indicated cities are located by junctions of national roads. Silesia City Centrum, located in the centre of Katowice (near the Intercity Road) is a mall of national importance, while of sub-regional significance are large-format stores located in the centres of Bielsko-Biała, Częstochowa, and Rybnik agglomerations. From the point of view of provision of services for the outer metropolitan zone, of importance are shopping malls located in suburbs of Bielsko-Biała, Częstochowa and Dąbrowa Górnicza. These are large-format stores that supports directly small-town and rural areas of the Silesian Voivodeship.

2. The outer metropolitan zone compared to the degree of development of communes of the Silesian Voivodeship

Metropolitan areas influence the development of places located in their outer areas. The local and regional development theory accentuates this influence, with particular stress put, on the one hand, on out-washing resources from the outer areas, and (on the other hand), the processes of redistribution of the metropolitan core and its direct back-up area development effects. However, the criteria and methods of delimitation of metropolitan areas, conditioning their number and spatial range, remain an open question [see *i.a.* Dawson 1992; Domański 2007; Heffner, Gibas 2012; Keeble *et al.* 1988; Kipnis, Swyngedouw 1988; Turok, Mykhnenko 2006].

Delimitation of the outer metropolitan zone is performed in order to define a field which is not located directly by a metropolis, but borders its functional area. Thus, a field that it is connected with the latter in a direct and indirect way. The choice of delimitation criteria and methods is not determined and it may be (and is) the subject of a subject-matter discussion with scientific and political aspects included. For the purposes of the study it was assumed that the outer area shall be separated as a derivate of separation of the metropolitan area, so it will constitute a part of metropolitan impact and be adjacent to terrains where this impact is insignificant.

The delimitation of external impact area for metropolises located in the Silesian Voivodeship³⁸ is to answer the following question: which communes (or sample thereof) will be appropriate to verify theses of the study, *i.e.* which of them should

³⁸ The delimitation of this area has been determined many times, see *i.a.*: [Czyż 2011; Krzysztofik, Runge, 2011; Smętowski *et al.* 2008].

be examined directly (surveys, interviews with representatives of Commune Offices) and indirectly (desk research, statistical analyses). In addition, considering the objectives of the research project, communes which will be selected for the study must remain in the impact area of at least one shopping mall, and preferably a couple of them.

In this part of the analysis, the following data was used:

- Partial indicators as at 2009, presenting: (a) population density, (b) municipal utility network density, (c) population growth, (d) total migration balance, (e) percentage share of women in total population, (f) percentage share of people in working age in total population, (g) share of people suffering long-term unemployment in the total of the unemployed, (h) percentage share of working people in non-agricultural sectors³⁹, (i) entities registered in REGON system per 1,000 citizens, (j) flats commissioned per 1,000 citizens, (k) availability of a general education upper secondary school (in km² per locality with such a school), (l) audience in cinemas per 1,000 citizens, (m) growth of water supply system in 2000-2010.
- a synthetic index determined with the use of Perkal method⁴⁰ which, essentially, is the average of all the indicators described above. In order to ensure comparability of features and partial indicators, standardisation was applied, taking into account the influence of a given factor on development tendencies. Indicators which characterise the area of a commune in a positive manner were included to the stimulants, *i.e.* high level of an indicator is characteristic most commonly of metropolitan areas, rather than areas of low metropolitan level. The vast majority of the selected indicators were classified as stimulants. Two indicators were considered destimulants, *i.e.* (g) share of people suffering long-term unemployment in the total of the unemployed, (k) availability of a general education upper secondary school (in km² per locality with such a school).

Results of the analysis in terms of the evolution of selected characteristics of the indicators under consideration have been presented with minimum, maximum, average values, and standard deviation taken into account. Statistical characteristics of indicators, also within the arrangement of small cities and Silesian Metropolis (GZM) cities, is complemented with graphical information. It makes it possible to view the arrangement of communes in terms of quarterly values of an indicator in the space of the Silesian Voivodeship. Location of shopping malls is marked on maps. Statistical and spatial characteristics of evolution of indicator values were preceded by subject-matter substantiation of validity of their selection for the purpose of the study.

³⁹ Introduced due to the lack of features in the place of the original indicator “share of people deriving their income from non-agricultural activities in the total population” proposed in the study [Trafas, Zborowski 2003].

⁴⁰ Perkal’s natural indicators method is applied to aggregate a complex of features or input indicators to the common vector of a general value (synthetic indicator W_i). It is an arithmetic average of standardised values of all features or indicators. The value of W_i indicator makes it possible to put spatial units in appropriate order, whereby the highest value of the indicator is used to characterise the spatial unit with best parameters of analysed features or indicators [see *i.a.* Heffner, Gibas 2007].

a) Population density

Metropolitan areas are characterised by a significant concentration of population. They constitute a magnet attracting citizens, on the one hand offering fine conditions of dwelling, while on the other hand – a well-paid job making it possible to use higher level services and attractions located in such areas.

In 2009, the population density in the Silesian Voivodeship fluctuated between 39 and 4,064 people per km². **At the average, a commune of the Silesian Voivodeship was inhabited by 376 people per km²**, and in most cases it was 67 people per km² (**in small cities: 155 people per km², in Silesian Metropolis (GZM) cities: 1,608 people per km²**). The standard deviation totalled 565 which means that a typical variation range of the indicator was contained in a range of up to 941 people per km². One fourth of communes of the Silesian Voivodeship were characterised by a population density below 93 people per km², these were mainly urban settlements located in rural areas in the northern part of the Silesian Voivodeship (Fig. 13 – coloured insert, p. 2). The median totalled 197 people per km². Most densely populated areas in the Silesian Voivodeship in 2009 were located in the voivodeship centre and cities and communes directly adjacent to these areas, with a population density above 475 people per km².

Shopping malls are mainly localised in spots of high population density, which is a prerequisite of a possibly large market.

b) Municipal utility network density

Metropolitan areas are characterised by a high density of municipal utilities. High population density, created by people preoccupying themselves mainly with non-agricultural activity, as well as a specific form of space usage subordinated to such circumstances, enforce urbanisation processes leading to the creation of towns.

In the Silesian Voivodeship, there is quite dense municipal utility network; the indicator value fluctuated between around 0.10 and 7.70. **At the average, 0.57 of a town was attributed to 100 km² of the poviat area**, and most commonly it was a density of 0.13 (**in small cities: 0.68 of a city, in GZM cities: 1.15 of a city**). The standard deviation totalled 0.51 which means that a typical variation range of the indicator was up to 1.09 of a city per 100 km² of the poviat area. For one fourth of Silesian Voivodeship communes the indicator's value was below 0.21 (Fig. 14 – coloured insert, p. 3). The median was 0.60 of a city per 100 km² of the poviat area. Cities were (and are) most concentrated in the central and south-western part of the Silesian Voivodeship; density of this area is above 0.68 of a city per 100 km².

Shopping malls are located mainly in urban settlements with very good and good supply of municipal utilities, so they benefit from neighbourhood effects.

c) Population growth

Metropolitan areas in Europe are characterised by low population growth values. The family model disseminated in these areas provides for low fertility rate and

more focus on improvement of life conditions of the family, rather than ensuring continuity of generations.

In the Silesian Voivodeship, there are quite substantial differences in the population growth distribution; its values range between -8 and 8.9 per mille. **At the average, the voivodeship area is characterised by a population growth at the level of -0.4 per mille**, but most often it is -0.8 per mille (**in small cities: -1.38 per mille, in GZM cities: -0.88 per mille**). The standard deviation in 2009 totalled 3.16 which means that a typical variation range of the indicator was contained between -2.76 and 3.56 per mille. For one fourth of Silesian Voivodeship communes the indicator's value was below 2 per mille, these were mainly rural areas in the north-eastern part of the voivodeship as well as the eastern part of the Upper Silesia Agglomeration (Fig. 15 – coloured insert, p. 3). The median was 0.10 per mille. The highest values of the indicator were noted for communes located within the belt north from Bielsko-Biala and south from Tychy (together with Rybnik and Żory); it is an area with population growth above 2.20 per mille.

A negative or positive population growth is not a guideline for identification of locations for shopping malls, however one may expect that a negative growth indicator shall be positively correlated with the locations of shopping malls.

d) Total migration balance

Metropolitan areas in the world are characterised by positive values of migration balance. A substantial number of work places which are attractive in terms of prestige and salary encourage settlement of people in these areas.

In the Silesian Voivodeship, the migration balance in 2009 was contained within a range of -14.44 and 19.74 per mille. **At the average, voivodeship communes were characterised by a migration growth at the level of -1.71 per mille**, but most often it was 3.81 per mille (**in small cities: 1.00 per mille, in GZM cities: -3.00 per mille**). The standard deviation for the period under consideration totalled 4.74 which means that a typical variation range of the indicator was contained between -3.03 and 7.45 per mille. For one fourth of Silesian Voivodeship communes the indicator's value was below -1.48 per mille, these were mainly municipal areas in its central part of the voivodeship (Fig. 16 – coloured insert, p. 4). The median was 2.02 per mille. The highest indicator values, above 6.13 per mille, were recorded for communes located around large cities and municipal agglomerations.

Shopping malls are located mainly in urban settlements characterised by a significant negative total migration balance, however it is not a factor on the basis of which locations are identified, even if in a long-run it may influence the profitability of a large-format store.

e) Percentage share of women in total population

Metropolitan areas are characterised by women outnumbering men. Good healthcare and trends promoting healthy life style of citizens of metropolitan areas are most important factors that contribute to a longer life of women.

In the Silesian Voivodeship, the percentage share of women in total population in 2009 ranged from 49.54 to 53.62%. **At the average, voivodeship communes were characterised by the value of the said indicator at the level of – 51.15%**, but most often it was 50.08% (**in small cities: 51.17%, in GZM cities: 51.93%**). The standard deviation for the period under consideration totalled 0.83% which means that a typical variation range of the indicator was contained between 50.32 and 51.98%. For one fourth of Silesian Voivodeship communes the indicator's value was below 50.64 per mille, these were mainly rural areas in north-eastern part of the voivodeship (Fig. 17 – coloured insert, p. 4). The median was 51.27%. The highest values of the indicator, above 51.84%, were recorded for large cities and communes located near them.

Shopping malls are mainly located in urban settlements with significant and large percentage share of women in the population. It should be highlighted that women constitute a substantial percentage of the customers of large-format stores.

f) Percentage share of people in working age in total population

Metropolitan areas are characterised by a high percentage of people in working age. Terrains attractive in terms of possible settlement attract mainly people in younger working age. On the other hand, people in older working age mainly appreciate access to higher level services and healthcare.

In the Silesian Voivodeship, the percentage share of people in working age in total population in 2009 ranged from 58.86 to nearly 80%. **At the average, voivodeship communes were characterised by the value of the said indicator at the level of 64.28%**, but most often it was 62.05% (**in small cities: 64.01%, in GZM cities: 66.41%**). The standard deviation for the period under consideration totalled 1.78% which means that a typical variation range of the indicator was contained between 62.50 and 66.06%. For one fourth of Silesian Voivodeship communes the indicator's value was below 63.43%, these were mainly rural areas in the southern, northern, and north-eastern part of the voivodeship (Fig. 18 – coloured insert, p. 5). The median totalled 64.39%. The highest values of the indicator, above 65.32%, were recorded for communes located near the central part of the voivodeship.

Shopping malls are mainly located in urban settlements with significant and large percentage share of people in working age in the total population. It should be stressed that this group constitutes a predominant percentage of customers of these commercial facilities.

g) Percentage share of people suffering long-term unemployment in the total of the unemployed

Metropolitan areas have a dynamic labour market. Despite relatively frequent changes of place of employment, people seeking employment enjoy substantial opportunities enabling them to find a relevant job. Long-term unemployment is limited by the market.

In 2009, the percentage share of people suffering long-term unemployment in the total of the unemployed ranged from values near 0 to nearly 15.8%. **At the average, voivodeship communes were characterised by the value of the said indicator at the level of 4.74%**, but most often it was nearly zero (**in small cities: 3.77%, in GZM cities: 3.19%**). The standard deviation for the period under consideration totalled 15.8% which means that a typical variation range of the indicator ranged up to 31.6%. For one fourth of Silesian Voivodeship communes the indicator's value was below 3.5%, these were mainly areas in the eastern part of the voivodeship, characterised by a favourable situation in relation to the Upper Silesian Agglomeration and Cracow Agglomeration (Fig. 19 – coloured insert, p. 5). The median was 5.10%. The highest values of the indicator, above 6.7%, were recorded for communes located between the Upper Silesian Agglomeration, Częstochowa and west from Rybnik.

Shopping malls are mainly localised in urban settlements of low long-term unemployment, as where long-term unemployment is present, possible market is limited.

h) Percentage share of people working in non-agricultural sectors

Metropolitan areas are characterised by vanishing agricultural sector. In these areas, sector of services (including in particular high level services) and industry sector (including in particular the so-called high technologies) are of predominant character.

In the Silesian Voivodeship, the percentage share of people working in non-agricultural sectors ranged from 59.28 to 99.8%. **Voivodeship communes were characterised by the value of the said indicator at the level of 82.73%**, but most often it was lower, *i.e.* 59.28% (**in small cities: 81.58%, in GZM cities: 99.42%**). The standard deviation for the period under consideration totalled 13.28% which means that a typical variation range of the indicator was contained between 69.45 and 96.01%. For one fourth of Silesian Voivodeship communes the indicator's value was below 79.7%, these were mainly areas in the northern and north-eastern part of the voivodeship (Fig. 20 – coloured insert, p. 6). The median was 87.76%. The highest values of the indicator, above 94.12%, were recorded for communes located near the Upper Silesian Agglomeration and Rybnik Agglomeration.

Shopping malls are located mainly in urban settlements with a high percentage of people working in non-agricultural sectors. At the present, the sector of services and industrial sector generate significantly higher income for workers than in the case of agricultural sector, which translates directly into the volume of the possible market.

i) Entities registered in REGON system per 1,000 citizens

In metropolitan areas, most enterprises are large enterprises with high human and financial potential. Therefore, although high population density in these areas does not translate into the volume of enterprises, it nevertheless creates a demand for a large number of work places.

In the Silesian Voivodeship in 2009, entities registered in REGON system per 1,000 citizens ranged from 4.3 to 282.86 entities. **At the average, voivodeship communes were characterised by the value of the said indicator at the level of 69.03 entities**, but most often it was higher, *i.e.* 99.27 entities (**in small cities: 79.99 entities, in GZM as little as: 6.87**). The standard deviation for the period under consideration totalled 47.48 entities which means that a typical variation range of the indicator was contained between 21.97 and 116.51 entities. For one fourth of Silesian Voivodeship communes the indicator's value was below 39.37 entities, these were mainly areas in the central and western part of the voivodeship (Fig. 21 – coloured insert, p. 6). The median was 71.56 entities. The highest values of the indicator, above 96.04 entities, were recorded for communes located near the central part of the voivodeship.

Shopping malls are located mainly in urban settlements with a low entrepreneurship rate. Large and medium sized enterprises and service providers constitute a source of income for a higher number of population than small business entities, which translates into the size of possible demand for shopping malls.

j) Flats commissioned per 1,000 citizens

Metropolitan areas are characterised by substantial investments in residential tissue. In core metropolitan areas, of predominant character are reconstruction investments that restore former splendour to the old residential tissue. In suburban areas, the prevailing investments are implemented on the primary market.

Flats commissioned in 2009 in the Silesian Voivodeship per 1,000 citizens amounted to 8.69 flats. **At the average, voivodeship communes were characterised by the value of the said indicator at the level of 2.43 flats**, but most often it was higher, *i.e.* 2.54 flats (**small cities: 2.09 flats in GZM cities: 1.81 flats**). The standard deviation for the period under consideration totalled 1.30 flats which means that a typical variation range of the indicator was contained between 1.13 and 3.73 flats. For twenty five% of Silesian Voivodeship communes the said indicator's value was below 1.38 flats, these were mainly areas in the central and western part of the voivodeship (Fig. 22 – coloured insert, p. 7). The median was 2.49 flats. The highest values of the indicator, above 3.17 flats, were recorded for communes located near Bielsko-Biała and Częstochowa.

The number of flats commissioned is not a guideline for identification of possible locations for shopping malls, however one may expect that a high number of flats will translate in the increase of a possible demand signalled on the part of customers of large-format stores.

k) Availability of a general education upper secondary school (in km² per locality with such a school)

Metropolitan areas are characterised by good availability of educational services (including at the higher level). Obtaining education, and thus – developing human potential, has become one of key investments. It is promoted particularly in the areas under consideration.

In 2009 in the Silesian Voivodeship, availability of a general education upper secondary school (in km² per locality with such school) ranged between 3.3 and 760.5 km². **At the average in voivodeship communes, one upper secondary general education school served 198.57 km²**, however significantly higher values dominated, *i.e.* 760.5 km² (**small cities: 190.94 km² (GZM cities: 15.84 km²)**). The standard deviation for the period under consideration totalled 225.41 km² which means that a typical variation range of the indicator was up to 423.98 km². For one fourth of Silesian Voivodeship communes the indicator's value was below 65.57 km², these were mainly large cities and communes located in the vicinity of Upper Silesian Agglomeration and Rybnik Agglomeration (Fig. 23 – coloured insert, p. 7). The median totalled 108 km². The highest values of the indicator, above 205.5 km², were recorded for communes located near Częstochowa.

Shopping malls are located mainly in urban settlements with good availability of general education upper secondary schools, which may indicate a possible easiness of leveraging employees with secondary education who are easy to train for the purposes of large-format stores.

l) Audience in cinemas per 1,000 citizens

Metropolitan areas are characterised by good availability of culture-forming services (including higher level services). The most popular service of this type is constituted by cinema shows displayed at the present mainly in modern facilities as multiplex.

In the Silesian Voivodeship, the audience of cinemas per 1,000 citizens (in 2009) ranged from 0 to 5506 seats. **At the average, in Silesian Voivodeship communes, the audience totalled 395.5 seats**, however zero was the predominant value (most communes do not have a permanent cinema), (**in small cities: 120.68 seats, in GZM cities: 1789.47 seats**). The standard deviation for the period under consideration totalled 952.86 seats which means that a typical variation range of the indicator was up to 1348.36 seats per 1,000 citizens. For one fourth of Silesian Voivodeship communes the indicator's value was below 24.74 people, these were mainly areas around Częstochowa and communes located in the vicinity of Upper Silesian Agglomeration (along with its northern part) and Rybnik Agglomeration (Fig. 24 – coloured insert, p. 8). The median was 42.87 seats. The highest values of the indicator, above 204.88 seats, were recorded for large cities and communes located in the poviats of Żywiec, Cieszyn, and Racibórz.

Many a time, state-of-the-art cinemas constitute an integral part of a shopping mall, so a significant correlation between the size of audience in cinemas and the location of the said stores should not be a surprise. On the other hand, shopping malls (especially the modern ones) are located in places where there are recipients for entertainment services.

m) Water supply network growth in 2000-2010

In metropolitan areas, the access to utilities of all kinds seems indispensable, and a key significance is attributed to the access to clean water. The growth of water supply network in a long run constitutes a condition for demographic and production potential of a given commune.

In the Silesian Voivodeship in 2000-2010, the water supply network in individual communes grew from 91.36 to 345.39% of the initial state. **At the average, the water supply network grew by 220.73%**, but most often it was even more, up to the level of 334.1% (**in small cities: 205.36%, in GZM cities: 125.27%**). The standard deviation for the period under consideration totalled 79.04% which means that a typical water supply system grew up to the level between 141.69 and 299.77%. One fourth of Silesian Voivodeship communes recorded a value of the indicator below 177.62% (Fig. 25 – coloured insert, p. 8). The median was 210.43%. The highest values of the indicator, above 287.23% of the initial state, were recorded for communes located in direct vicinity of Bielsko-Biała, Częstochowa, and Rybnik.

The access to clean, drinkable water is a prerequisite of agglomeration phenomena, and shopping malls also need to use water access – the more so that they are often located in the city suburbs or areas hitherto non-invested.

n) Synthetic evaluation of the development level of Silesian Voivodeship communes

In the Silesian Voivodeship, the Perkal synthetic index calculated for data for 2009 amounted between -0.85 and 1.43. **At the average in the Silesian Voivodeship, a commune was granted a score near to 0**, while in most cases it was -0.28 (**in small cities: -0.07, in GZM cities: 0.41**). A typical variation range of the index was contained between -0.37 and 0.37. One fourth of communes of the Silesian Voivodeship were characterised by an index value below -0.18, these were mainly centres located in rural areas, in the northern part of the Silesian Voivodeship, and on the southern boundaries of the Żywiec powiat (Fig. 26 – coloured insert, p. 9). The median was 0.09.

The highest values of the index were recorded for large cities and areas directly adjacent to them (apart from Częstochowa), located in the voivodeship centre, as well as cities and communes situated between the Upper Silesian Agglomeration and the Rybnik agglomeration, with an index value above 0.35.

In order to define the research area, the values of indicators were transformed in relation to a s-shaped ordering function with the following relations maintained: (a) the highest value of an indicator deemed to be a stimulant was fixed to 255, (b)

the lowest value of an indicator deemed to be a destimulant was fixed to 255 (Fig. 27 – coloured insert, p. 9) The next step was to prepare the weight map. Weights were prepared for each point of the map according to the function of distance from the core city of the metropolis. City is understood here as a spatial settlement unit with population above 100 thousand. Then, each point of map of phasified indicators was divided by the unit weight map (Fig. 28 – coloured insert, p. 10).

The final step of delimitation consisted in determination of average values of indicators and division of communes into five taxonomical groups in line with the evolution of the average value relative to quartiles, calculated on the basis of it (Fig. 29 – coloured insert, p. 10):

- (5) core metropolitan cities
- (4) metropolitan area (without core)
- (3) metropolitan impact area – 1. level impact (direct)
- (2) metropolitan impact area – 2. level impact (indirect)
- areas outside the metropolitan impact area

The term *outer metropolitan zone* shall be used to denote communes which are located within the direct (group 3 – yellow) and indirect (group 2 – pale green) metropolitan impact area (group 4 – bright red), concentrated around its core (group 5 – dark red). Thus, the outer metropolitan zone of the Silesian Voivodeship includes

Table 12

Communes selected for the survey

No.	Commune	Powiat	Group	No.	Commune	Powiat	Group
1	Goeszów	Cieszyn	2	1	Wojkowice	Będzin	3
2	Skoczów	Cieszyn	2	2	Szczyrk	Bielsko-Biała	3
3	Kruszyna	Częstochowa	2	3	Wilamowice	Bielsko-Biała	3
4	Toszek	Gliwice	2	4	Olsztyn	Częstochowa	3
5	Koszęcin	Lubliniec	2	5	Rudziniec	Gliwice	3
6	Woźniki	Lubliniec	2	6	Kłobuck	Kłobuck	3
7	Myszków	Myszków	2	7	Wręczyca Wielka	Kłobuck	3
8	Koziegłowy	Myszków	2	8	Orzesze	Mikolów	3
9	Racibórz	Racibórz	2	9	Ornontowice	Mikolów	3
10	Tworóg	Tarnowskie Góry	2	10	Pszczyna	Pszczyna	3
11	Gorzyce	Wodzisław	2	11	Suszec	Pszczyna	3
12	Zawiercie	Zawiercie	2	12	Kornowac	Racibórz	3
13	Żywiec	Żywiec	2	13	Nędza	Racibórz	3
14	Ślemień	Żywiec	2	14	Tarnowskie Góry	Tarnowskie Góry	3
				15	Imielin	Bieruń and Łędziny	3
				16	Chelm Śląski	Bieruń and Łędziny	3
				17	Wodzisław Śląski	Wodzisław	3

Source: Own work.

84 communes in total (50.30% of all the communes of the voivodeship), whereby 39 communes remain within the direct metropolitan impact area (23.35% of all the communes of the voivodeship).

All in all, 31 communes have been selected for the survey conducted for the purposes of the research grant (Tab. 12 and Fig. 30 – coloured insert, p. 11).

The communes have been selected deliberately. The selected communes represent 36.90% of communes that form the outer metropolitan zone (which means that 18.65% of Silesian Voivodeship communes have been selected). This group includes 17 communes from the area of direct metropolitan impact and 14 communes from the area of indirect metropolitan impact. The communes belong in territorial terms to 16 from among 17 poviats.

2. Dynamics of changes in communes of the outer metropolitan zone

How shopping malls influence the life of small cities located in the outer metropolitan zone? Any attempt to answer this question should be preceded by determination of a general level of development of the communes (*e.g.* with the use of Perkal synthetic index – which was done in the preceding item). However, this measure is not sufficient. Determination of the level does not give information about the pace and direction of changes. General tendencies in the scope of development⁴¹ (direction of changes and determinants of dynamics thereof) were identified with the use of the semi-annual pace of changes calculated on the basis of indices (with variable basis) for the following features:

- in the scope of general conditions of development and counteracting unfavourable demographic tendencies: (a) actually residing population according to data for 2000-2011;
- in the scope of operation and shaping the environment for entrepreneurs: (b) number of private entities registered in REGON system as per data for 2002-2011;
- in the scope of improvement of residential conditions and general tendencies connected with the process of spilling of cities: (c) number of flats in 2002-2010;
- in the scope of improvement of the state and operation of administration, and in particular ensuring stable development-related attitudes within the commune: (d) own income of commune budgets in 2000-2011.

Results of the analysis in terms of the development of the selected characteristics of indicators under consideration have been presented with minimum, maximum, average values, and standard deviation taken into account. Presentation of the said indicators, also within the arrangement of: the outer area of Silesian metropolis, small

⁴¹ Which, admittedly, do not provide an answer to the question posed, but may nevertheless constitute an important information complementing the conducted survey (see chapters V to VII).

cities and GZM cities, is complemented with graphical information, which makes it possible to observe the distribution of data (in terms of 4 quartiles of indicator's value) in the space of the Silesian Voivodeship.

a) Actually residing population according to data for 2000-2011

Generally speaking, communes of the Silesian Voivodeship are characterised by divergence in the scope of semi-annual growth of actually residing population counted as at 31 December, [Silesian], between -1.32% and 1.7%. **At the average, population in communes grows by 0.03% year over year**, but most often it is a higher value of 0.41% (in core cities: -0.55%, in metropolitan areas (without core): 0.28%, in the direct metropolitan impact area: 0.30%, in the indirect metropolitan impact area: 0.07%, areas outside the metropolitan impact area: -0.18%, **in small cities: -0.08%, in GZM cities: 0.56%**).

The standard deviation in 2009 totalled 3.03 which means that a typical variation range of the indicator was contained between -3.00 and 3.06%. For one fourth of Silesian Voivodeship communes the indicator's value was below -0.22, these were mainly rural areas in the north-eastern part of the voivodeship and its large cities (Fig. 31 – coloured insert, p. 11). The median was 0.13%. The highest pace of changes was recorded for communes located in Bielsko-Biała and Rybnik agglomeration as well as in the southern area of communes located in the direct vicinity of the Upper Silesian Agglomeration. It is an area with pace of changes at the level above 0.49% year over year.

b) Number of private entities registered in REGON system as per data for 2002-2011

The semi-annual pace of changes in the Silesian Voivodeship in the scope of the number of private entities registered in REGON system remained between -2.38 to 5.86%. At the average, **communes of the voivodeship were characterised by the pace of changes at a level of 1.31% year over year**, however most often it was 2.33% (in core cities: 0.35%, in metropolitan areas (without core): 1.83%, in the direct metropolitan impact area: 1.49%, in the indirect metropolitan impact area: 1.18%, areas outside the metropolitan impact area: 1.34%, **in small cities: 1.09%, in GZM cities only: 0.68%**). The standard deviation for the period under consideration totalled 1.27% which means that a typical semi-annual variation range of the indicator was contained between 0.04 and 2.58%. For one fourth of Silesian Voivodeship communes the indicator's value was below 0.67%, these were mainly large cities of the Silesian Voivodeship and small rural communes (Fig. 32 – coloured insert, p. 12). The median was 1.25%. The highest pace of changes year over year was recorded for communes located in the western part of the Silesian Voivodeship, located in direct vicinity of the Upper Silesian Agglomeration; it is an area with pace of changes at a level above 1.96% year over year.

c) Number of flats in 2002-2010

In the Silesian Voivodeship, the semi-annual pace of changes in the scope of the number of flats fluctuated between 0.04 and 2.62%. At the average, **voivodeship communes were characterised by the value of the said indicator at the level of 0.83%**, but most often it was 1.22% (in core cities: 0.43%, in metropolitan areas (without core): 0.85%, in the direct metropolitan impact area: 1.06%, in the indirect metropolitan impact area: 0.90%, areas outside the metropolitan impact area: -0.74%, **in small cities: 0.71%, in GZM cities: 0.30%**). The standard deviation for the period under consideration totalled 0.48% which means that a typical variation range of the indicator was contained between 0.35 and 1.31%. For one fourth of Silesian Voivodeship communes the indicator's value was below 0.42, these were mainly communes located in the western and eastern part of the Upper Silesian Agglomeration, as well as rural areas west from Rybnik (Fig. 33 – coloured insert, p. 12). The median was 0.82%. The highest pace of changes year over year was recorded for communes located in the Bielsko-Biała agglomeration and in direct vicinity of Upper Silesian Agglomeration (from its southern side); it is an area with pace of changes at a level above 1.17% year over year.

(d) Own income of commune budgets in 2000-2011

In the Silesian Voivodeship, the semi-annual pace of changes in the scope of own income of commune budgets (together with communes with poviats rights) fluctuated between 2.79 and 15.29%. At the average, **voivodeship communes were characterised by the value of the said indicator at the level of 8.55%**, but most often it was 10.67% (in core cities: 8.33%, in metropolitan areas (without core): 8.56%, in the direct metropolitan impact area: 9.12%, in the indirect metropolitan impact area: 8.26%, areas outside the metropolitan impact area: 8.45%, **in small cities: 8.01%, in GZM cities: 8.13%**). The standard deviation for the period under consideration totalled 1.93% which means that a typical variation range of the indicator was contained between 6.62 and 10.48%. For one fourth of Silesian Voivodeship communes, the semi-annual pace of changes run at a level below 6.84 (Fig. 34 – coloured insert, p. 13). The median was 8.50%. The highest pace of changes year over year was recorded for communes located north from Częstochowa, in Rybnik agglomeration and in the southern area of communes located in direct vicinity of the Upper Silesian Agglomeration; it is an area with a pace of changes at the level above 9.83% year over year.

In the Silesian Voivodeship, the averaged pace of yearly changes fluctuated between 0.04 and 5.50%. At the average, **voivodeship communes were characterised by the value of the pace of changes at the level of 2.68%**, but most often it was 3.66% year over year (in core cities: 2.14%, in metropolitan areas (without core): 2.88%, in the direct metropolitan impact area: 2.99%, in the indirect metropolitan impact area: 2.60%, areas outside the metropolitan impact area: 2.58%, **in small cities: 2.83%, in GZM cities: 2.43%**). The standard deviation for the period under consideration to-

talled 0.71% which means that a typical variation range of the indicator was contained between 1.97 and 3.39%. For one fourth of Silesian Voivodeship communes the semi-annual pace of changes run at a level below 2.05 (Fig. 35 – coloured insert, p. 13). The median was 2.68%. The highest pace of changes year over year was recorded for communes located in the Bielsko-Biała agglomeration and Rybnik agglomeration; it is an area with a pace of changes at a level above 3.24% year over year.

To sum up the investigations on the evolution of the semi-annual pace of changes it may be stated that the highest dynamics in this scope is observed in the direct metropolitan impact area (in the account, it was on the first position three out of four times, and it was on the third position once). The second position is taken by the metropolitan area (without core), in the account, it was on the first position once, on the second position twice, and once on the third position. The third rank was taken by the indirect metropolitan impact area (it was second twice, third once, and last once). (Fig. 36). **When considering direct and indirect metropolitan impact area together, it may be said that the area is on the second position (behind the metropolitan area – without core (Fig. 37)).**

At the same time, on the basis of the indicators used, it may be observed that the best results as regards the semi-annual pace of changes in the outer metropolitan

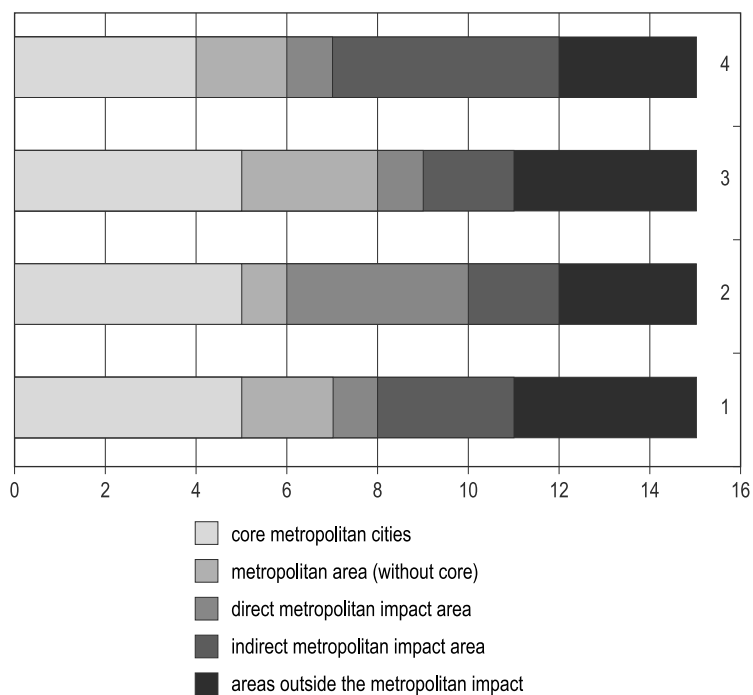


Figure 36. Positioning of the cities of metropolitan core, metropolitan area (without core), communes in direct and indirect metropolitan impact area and the area outside the metropolitan impact in the light of the evolution of semi-annual pace of changes

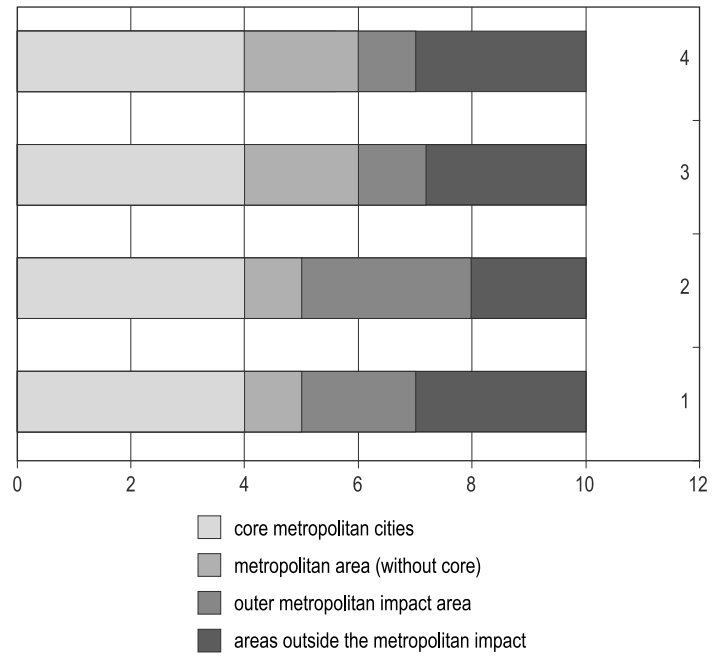


Figure 37. Positioning of the cities of metropolitan core, metropolitan area (without core), communes in the outer metropolitan impact area and the area outside the metropolitan impact in the light of the evolution of semi-annual pace of changes

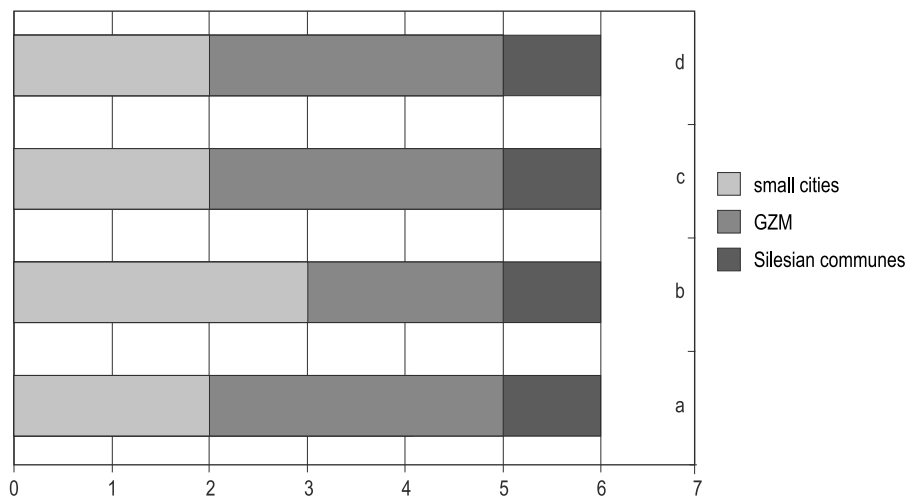


Figure 38. Positioning of small cities in relation to GZM cities as well as communes of the Silesian Voivodeship in the light of the evolution of semi-annual pace of changes

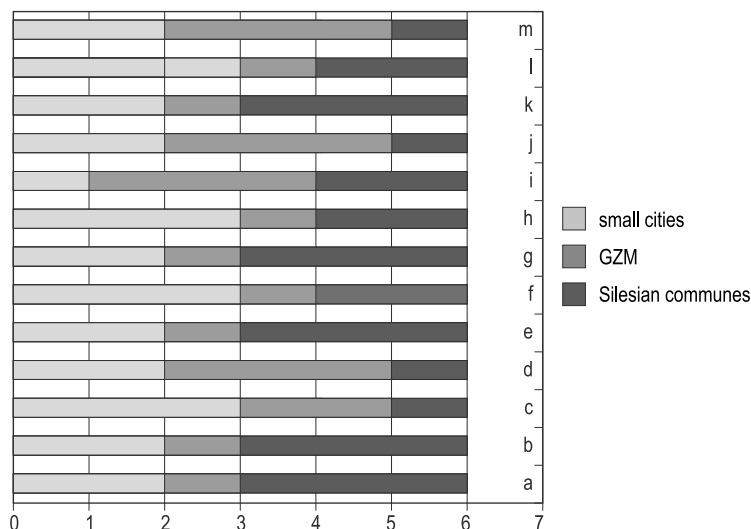


Figure 39. Positioning of small cities in relation to GZM cities as well as communes of the Silesian Voivodeship according to data for 2009

zone are recorded in the scope of improvement of residential conditions (connected with the processes of spilling of cities), in the scope of general development conditions and counteracting unfavourable demographic tendencies as well as in the scope of improvement of the state and operation of administration, and in particular to ensure stable development-related attitudes within the commune. In the scope of the improvement of operation of and shaping the environment for entrepreneurs, a higher pace of changes is recorded for the metropolitan area (without core) as well as areas outside the metropolitan impact area.

At the same time it may be noted that the dynamics of changes in small cities is lower than in an average commune of the Silesian Voivodeship (in the account, the latter were always on the first position, while small cities were on the second one three times) (Fig. 38). At the same time, on the basis of the adopted indicators it may be observed that small cities show higher dynamics of changes than cities comprising GZM. **Small cities of the Silesian Voivodeship develop at a higher pace than GZM cities, but at a slower pace than an average commune in the Silesian Voivodeship.** It should be remembered, however, that **the level of development of small cities in the Silesian Voivodeship** (determined on the basis of the Perkal synthetic index) **is lower than the level of development of GZM cities** (in the account, the latter were on the first position thirteen times and small cities only once), (Fig. 39). At the same time it may be observed that an average commune of the Silesian Voivodeship was on the first place third times. **Therefore, small cities subject to analysis are less developed also when compared to the average commune of the Silesian Voivodeship.**