NICOLAUS COPERNICUS UNIVERSITY IN TORUŃ

Bulletin of Geography. Socio-economic Series, No. 62 (2023): 87-106
http://doi.org/10.12775/bgss-2023-0036

BULLETIN OF GEOGRAPHY. SOCIO–ECONOMIC SERIES

journal homepages:
https://apcz.umk.pl/BGSS/index
https://www.bulletinofgeography.umk.pl/

How are suburbanization and peri-urbanization not the same? Key differences in urban regions in Central and Eastern European countries: the case of cities in southern Poland

Andrzej Zborowski[1, CDFMR], **Jadwiga Gałka**[2, CDFMR], **Małgorzata Surmacz-Wybrańczyk**[3, CDFMR]

[1,2,3]*Jagiellonian University in Kraków*, Institute of Geography and Spatial Management, Poland; [1]e-mail: andrzej.zborowski@uj.edu.pl, https://orcid.org/0000-0002-6268-3594; [2]e-mail: jadwiga.galka@uj.edu.pl, https://orcid.org/0000-0002-6728-8497; [3]e-mail: malgorzata.surmacz@uj.edu.pl, https://orcid.org/0000-0002-5679-4482

How to cite:
Zborowski, A., Gałka, J. & Surmacz-Wybrańczyk, M. (2023). How are suburbanization and peri-urbanization not the same? Key differences in urban regions in Central and Eastern European countries: the case of cities in southern Poland. *Bulletin of Geography. Socio-economic Series*, 62(62): 87-106. DOI: http://doi.org/10.12775/bgss-2023-0036

Abstract. The aim of the paper is to discuss differences between suburbanization and peri-urbanization using the Kraków, Tarnów, and Nowy Sącz urban regions in the Province of Małopolska (Małopolskie Voivodship) as a case study. The paper highlights the lack of distinction in the use of these terms in Central and Eastern European (CEE) countries and in the Polish research literature, where these two unique urban decentralization processes (suburbanization and peri-urbanization) are described using the same term: suburbanization. In spite of the terminological ambiguities discussed in the paper and lack of agreement on ways to distinguish the two concepts as well as significant difficulties in their operationalization the analysis presented in the current study demonstrates that there does exist a case for a distinction in the treatment of suburbanization and peri-urbanization in many post-socialist urban regions.

Article details:
Received: 20 July 2023
Revised: 26 December 2023
Accepted: 30 December 2023

Key words:
urban studies,
peri-urbanization,
suburbanization,
CEE countries,
Poland

Contents:

1. Introduction

The transition from a socialist economy to a market economy that occurred in Central and Eastern Europe 30 years ago did not only trigger dynamic processes of political, economic, and social change, but also produced a colossal impact on the social and functional aspects of urban regions. These changes in the post-socialist city included rapid commercialization and regeneration of urban centers, but also suburbanization (Szymańska & Matczak, 2002; Szymańska, 2007; Sýkora & Bouzarovski, 2012; Hirt, 2013; Stanilov & Sýkora, 2014). This process began to strongly affect eastern German states in the early 1990s (Nuissl & Rink, 2005; Schmidt, 2011). In the late 1990s suburbanization began to impact Central and Eastern Europe (Ouředníček, 2007; Novotný, 2016; Krzysztofik et al., 2017; Kovács at al., 2019) and the Baltic states (Tammaru, 2001; Leetmaa et al., 2009; Krišjane & Berzinš, 2012). By the start of the 21st century it had affected all countries in Southeastern Europe (Brade et al., 2009, Stanilov & Hirt, 2014).

One common factor in suburbanization across Central and Eastern Europe as well as Southeastern Europe, especially in the early years of the process, was the spatial concentration of this process. Large metropolitan areas served as the starting point of suburbanization in these parts of Europe (Tammaru, 2001; Rudolph & Brade, 2005; Kok & Kovács, 2006; Ouředníček, 2007; Hirt 2007).

In comparison with the number of studies on suburbanization in large metropolitan areas there are relatively few studies on regional and subregional cities in Central and Eastern Europe. Exceptions in this area of research consist of studies on suburbanization in the former DDR (Nuissl & Rink, 2005; Reckien & Luedeke, 2014), cities in Czechia (Sykora & Ouředníček, 2007; Kubeš, 2015) and cities in Poland (Kurek et al., 2014, Kaczmarek & Mikuła, 2019; Krzysztofik et al. 2017). The small number of works on non-capital cities leads us to believe that there is a need for more research on the transformation of the fringe of these smaller cities. Research work on small cities would make it possible to examine the still relatively unknown field of the post-socialist city (Ferencuhova, 2016; Popescu, 2020).

As shown by the examples of urban decentralization in Central and Eastern Europe cited above, the focus of researchers has been the suburban narrative, and very rarely the peri-urban narrative of the development process in the urban periphery. Striking is the homogeneity of the terminology used in the studies focused on the suburban zone, suburbs, and process of suburbanization in the post-socialist urban periphery. The term urban sprawl is also employed (Haase & Nuissl, 2007; Schmidt et al., 2015; Kovacs et al., 2019). Only a few works use the term peri-urban to describe the urban fringe zone (Lincaru et al., 2016; Biegańska et al., 2018). Extremely few studies on post-socialist cities utilize related terms such as urban fringe (urban zone), rural-urban-fringe, urban-rural fringe, rural-urban interface, exurb, and hinterland in their analysis. These terms are used extensively in urban research across the world (Hoggart, 2005; Woods & Heley, 2017). The issues associated with urban decentralization in post-socialist cities brings attention to two fundamental problems in research on these cities:

1. Strong concentration of research work on urban decentralization in capital cities along with a large shortage of works on regional and subregional cities,
2. Few studies on post-socialist urban decentralization in terms of its peri-urbanization aspects, and this applies to all levels of urban research.

The main purpose of the present study was to either confirm or deny the occurrence of suburbanization and peri-urbanization across the fringes of the post-socialist city as patterns characterized by their own dynamics, with a focus on regional and subregional cities. Another aim of the paper is to situate the process of peri-urbanization in a theoretical context related to urban development in terms of a phase approach.

One additional question appears and it is related to a broader theoretical treatment which assumes that peri-urbanization is an independent stage of urban decentralization in the classic model of urban region development stages by Klaassen et al. (1981) and van den Berg et al. (1982). This question is the following: Can peri-urbanization be included in the aforementioned model by expanding its 4-phase approach to a 5-phase approach, where peri-urbanization is the fifth phase? The analysis of the nature and rate of decentralization processes in the Kraków urban region, a major city in Poland, and in regional cities such as Tarnów and Nowy Sącz located in southern Poland should allow one to answer the abovementioned questions.

The remaining parts of the paper are organized as follows: Section 2 presents basic data on the study area along with source materials and methods used in the study. Section 3 provides a discussion of the possibility of the use of a fifth phase in the Pealinck – van den Berg model in research on urban decentralization. The remaining sections provide an

analysis of results as well as a discussion of the results and a summary in the conclusions section.

2. Theoretical background

A significant feature of urban decentralization processes in Central Europe, as noted in the introduction section, is a focus on the various dimensions of suburbanization in the post-socialist city, but without much concentration on peri-urbanization processes. There are several reasons for this gap in research. One major reason is the relatively less advanced state of urban decentralization in cities in Central and Eastern Europe compared with Western Europe (Piorr et al., 2011, Ravetz et al., 2013). This gap is also partly due to general research trends present in Western Europe that focus in the French narrative (peri-urbanization) and British narrative (suburbanization and later peri-urbanization) of urban decentralization. According to M. Woods and J. Heley, "The French-derived "periurban" has arguably become the most widespread term used in the international literature…" (Woods & Heley, 2017, 28).

There is yet another potential reason why the term peri-urbanization is not often used in the studied region and this reason is that the suburban zone and suburbanization processes are treated as interchangeable with the rural-urban fringe and include a broad spectrum of zones up to and including the rural hinterland. Some authors in the West also discuss this type of broad spectrum in their theoretical analysis of urban decentralization (Forsyth, 2012). On the other hand, Nelson and Sanchez (1999, 689) argue that ex-urbanization (known as peri-urbanization in Europe) is not different from suburbanization – and "is simply the latest incarnation of the continued suburbanization of American cities."

However, Forsyth (2012, 279) notes the long tradition of nomenclature in the scientific literature that focuses on suburbanization in the following manner: "The term suburb represents a long-standing and viable term for describing development beyond the core city." The author also writes that peri-urbanization is not a very clearly defined alternative term to the traditional term "suburbanization." It may be assumed that many researchers studying decentralization in Central and Eastern European urban regions share this view.

It is noteworthy that the views of these researchers are also reflected in the generation of urban region lifecycle models (Klaassen et al., 1981; van den Berg et al., 1982; Cheshire & Hay 1989), which treat suburbanization as a fundamental process, aside from the process of deurbanization, in the decentralization of urban regions. The abovementioned models treat the functional urban region as consisting of two basic and integrated zones – the central city (built-up core) and the ring around it – also designated a city's hinterland area or commuter zone. Each zone in the urban region differs in terms of its rate of population growth or decline, which drives the occurrence of successive stages of urban development – urbanization, suburbanization, deurbanization, and reurbanization (Klaassen et al. 1981; van den Berg et al., 1982). Each stage is affected by centralization and decentralization processes occurring in the urban region (Cheshire, 1995).

The models along with their modification have played a significant role in studies on suburbanization and more broadly decentralization in urban regions and major metropolitan areas primarily in Western Europe (Cheshire, 1995; Champion, 2001; Antrop, 2004; Kabisch et al. 2010; Wolf, 2017). They have also been tested in the case of cities in Central and Eastern Europe (Zborowski, 2005; Leetmaa & Tammaru, 2007; Kabisch et al., 2010; Wolf 2017). The abovementioned studies discuss the occurrence of decentralization including suburbanization in line with the stage model of the urban cycle, but most did not make reference to the broader spatial integration of suburbanization with peri-urbanization, which could be treated as some type of extended suburbanization (Bourne, 1996).

The phase of integration between suburbanization and peri-urbanization (also known as ex-urbanization) may be described as a suburbanization-peri-urbanization stage, which could be treated as a variant of the classic model by Klaasen and van den Berg. This type of approach is observed in works on suburbanization and peri-urbanization by Fertner (2012) on the city of Copenhagen, Rontos et al. (2011) for Athens, and Bourne (1996) for American cities. This then prompts the following question: Given the increasingly strong spatial suburbanization effects noted in urban regions, can the suburbanization stage including that in post-socialist cities be termed a suburbanization-peri-urbanization stage? Or should the two processes be treated as a set of separate processes, which means that the classic model of urban decentralization needs to be modified?

We believe that in the era of increasing influence of the central city on its surroundings, which creates spatially huge urban regions, such

as Friedmann and Miller's (1965) urban field, regional city by Bryant et al. (1982), outer city by Herington (1984), Zwischenstadt (in-between city) by Sieverts (2003), rural–urban-region (RUR) by Ravetz et al. (2013), as well as Viganò's (2013) horizontal metropolis, there is a growing need to reconceptualize the internal spatial and functional structure of the urban region and that of urban development processes at the regional scale. These regions are also experiencing significant spatial and morphologic fragmentation (Antrop, 2004) and are characterized by an increasingly high complexity of the functional structure as well as growing social polarization in the urban hinterland (Arapoglou & Sayas, 2009).

It is our view that the urban development model needs to include a new phase in addition to the suburbanization phase – it needs to include peri-urbanization. Herein we propose a five-stage model of urban development (Table 1), which is related to the model proposed by Klaasen et al. (1981) and van den Berg et al. (1982), but for the purpose of this study we treat this new, updated model as a useful heuristic tool. Hence, this is not a classic model based on phases and sequences, which is why we do not make reference to phases and stages, but states of urban development. At the same time, this approach does not make direct reference to the sequence-based classic model, but only identifies certain states of urban development. In this approach, a city or urban region may jump from one state to another without following a preset sequence of stages or phases (Kroll & Kabisch, 2012). It may also exist in a given state of development in two difference stages or phases such as suburbanization and peri-urbanization (Fertner, 2012) as well as suburbanization and reurbanization (Morelli et al., 2014).

The entire spatial pattern of urban region development is based on the regional scale, thus the inside of this system is characterized by decentralization and centralization (Cheshire, 1995). On the other hand, concentration and deconcentration are used to describe development dynamics at the higher-than-regional scale (Novotný, 2016) (Table 1). The rates of change in these states and corresponding types of intra-regional and inter-regional dynamics are highly variable, which affords

Table 1. Peri-urbanization in the course of intra- and interregional processes in urban regions as well as states of urban development

States (stages) of urban development	type	Intraregional processes dynamics in the urban region				Interregional processes (outside urban region)	
		core	near hinterland	outer hinterland	urban region	types	dynamics
Urbanization	strong centralization	++	0	-	+	strong concentration	--
Suburbanization	slow decentralization	0/-	++	0	++	strong concentration	--
Peri-urbanization	advantage of decentralization over centralization	-/0	+	+	+/++	slowly declining concentration slow counter-urbanization	-
Deurbanization	strong decentralization	--	-	0	--	strong deconcentration counter-urbanization	++
Reurbanization	advantage of centralization over decentralization	+	0	-	+	slow concentration declining counter-urbanization	-

Explanations: -, --, 0, +, ++ strength of the impact of a given process
Source: Author's own work.

the term "hybrid development" of the urban region (Hoggart, 2005) and reflects advanced urban-rural linkages (Mayer et al., 2016).

The newly proposed pattern of urban development includes an intra-regional process of change in the form of peri-urbanization as a separate state of urban regional development. This approach makes it possible to look at peri-urbanization as a process independent of suburban development, whose uniqueness is rooted in findings available in research on the relationship between suburbanization and peri-urbanization in urban regions (EUROSTAT, 2010; Ravetz et al., 2013). The studies illustrate changes in the structure of the two processes leading to the formation of qualitatively different urban landscapes (Hoggart, 2005). Structural differences are noted in studies focused on land use type and structure in the peripheral areas of urbanized regions (Gallent, 2006) and in studies on transformation processes (Gant et al., 2011).

Suburban and peri-urban diversification is also reflected in spatial planning and regional management (Ekers et al., 2012, Hamel & Keil, 2016) as well as in the job structure of local residents (Madsden et al. 2010) and access to jobs (Nelson, 1992). The demographic structure and household structure of these areas also differ (Nelson & Sanchez, 1999) in relation to the motives of particular residents, for example ex-urbanites, for moving from the central city (Zasada, 2011).

This brief description of variances in the two studied urban zones does clearly suggest a multidimensional nature of both suburbanization and peri-urbanization (Shaw et al., 2020) as processes characterized by a variety of linkages between different phenomena. The complexity of these phenomena suggests the need to examine urban regions in terms of both suburban and peri-urban areas as independent places – each with its own unique social, functional, settlement, planning, and management characteristics. Concerning the abovementioned differences between the said zones, we define the suburbanization zone as an area situated in direct contact with the central city. In Central and Eastern Europe – including Poland – this applies to the areas situated adjacent to the administrative boundary of the central city. This zone normally surrounds the city – yet its actual spatial extent may vary thanks to certain characteristics of the natural environment as well as historically determined functions linkages with rural areas. On the other hand, the peri-urbanization zone is a geographically expansive area, situated a certain distance from the administrative boundaries of the central city. It is found beyond the suburbanization zone of the central city. The peri-urbanization zone is characterized by less intensive functional linkages with the central city than the suburbanization zone. It features a lower population density, relatively high share of farmland, and highly dispersed housing and business areas. A broad definition of peri-urbanisation is found in the summary of a report prepared within the framework of the PLUREL project (dedicated to peri-urban areas in Europe). A peri-urban area is formally defined as "an area found between urban settlement areas and their rural hinterland. Larger peri-urban areas may include towns and villages located within an urban agglomeration. Such areas are often fast-changing, with complex patterns of local land use and landscape, spatially fragmented between local or regional boundaries" (Piorr et al., 2011:10). The functional aspect of peri-urban areas is emphasised by Ravetz et al. (2013:13) who note that they are "not just a fringe in-between city and countryside, a zone of transition, rather they are a new kind of multi-functional territory".

To sum up the above characteristics of peri-urban zones, they may be described as areas with high rates of social and spatial change resulting from the available mix of typically urban phenomena with those, representative of rural areas, distinguished by relatively low population density, dispersed human settlement, and high functional diversity with a predominance of rural landscapes. In the zone in question, compared to the suburban zone, there is a lower intensity of population inflows and in the overall volume of inflows, residents coming from outside the urban region have an advantage.

This unique nature should be reflected in the scientific division of peripheral urban areas into the near-hinterland (suburban zone) and distant hinterland (peri-urban zone) (Table 1) as well as in the states of urban region development: i.e. urbanization, suburbanization, peri-urbanization, deurbanization, and finally reurbanization.

3. Study area, data and methods

3.1. Study area

In this paper, the issues of suburbanization and peri-urbanization are discussed in the context of Małopolska Province in southern Poland (Fig. 1), as a region affected by extensive urban decentralization processes (Biegańska et al., 2018). As shown by the

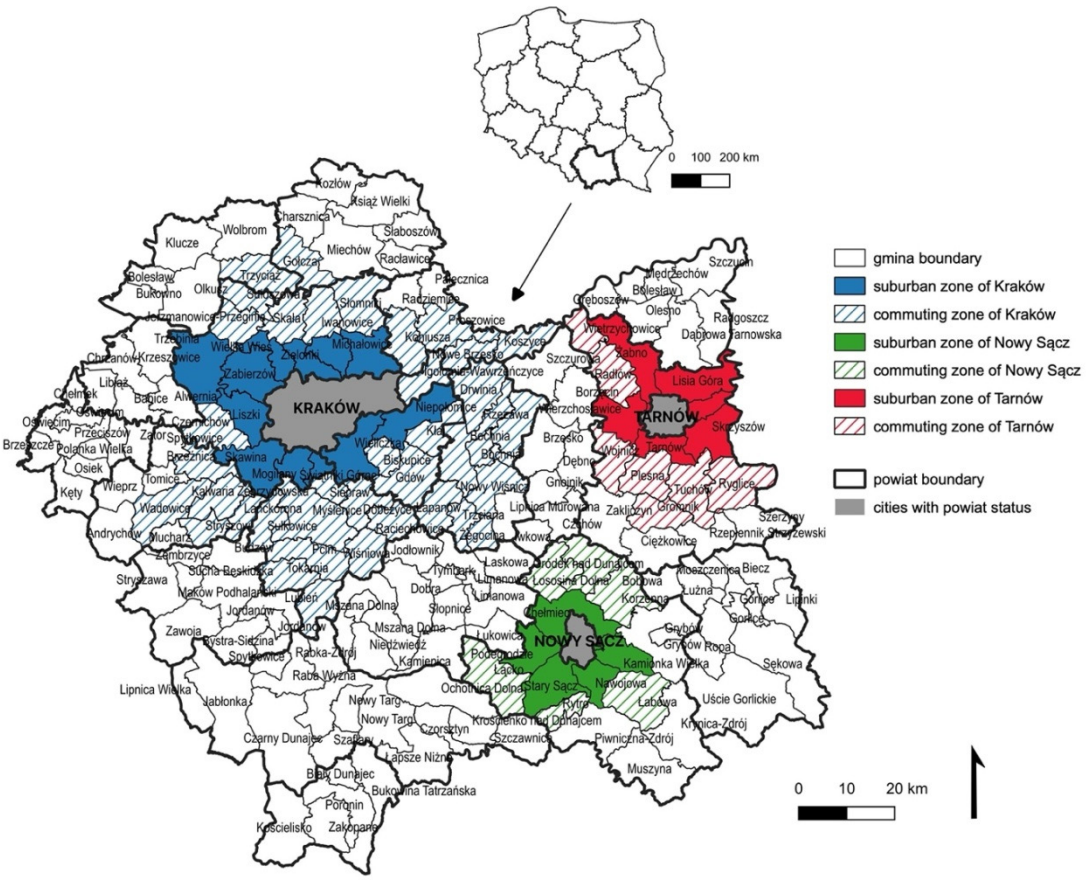

Fig. 1. Administrative division of Małopolskie Voivodship
Source: author's own work based on The Małopolskie Voivodship Spatial Development Plan and CSO map

PLUREL program (Piorr et al., 2011), Małopolska Province is ranked among the top ten regions of the European Union characterized by the highest degree of peri-urbanization. Research on suburbanization and peri-urbanization in this paper focuses on the largest cities of Małopolska Province: Kraków, Tarnów, Nowy Sącz. The urban regions of the three cities are examined herein in terms of the zone of influence of each city determined on the basis of work commuting patterns identified for each studied city (Guzik et al., 2010).

Kraków is the second largest city in Poland – after Warsaw. It is considered to be functionally the most important non-capital city in Central and Eastern Europe characterized by a population larger than that of many capital cities in the region (Table 2) such as Vilnius, Bratislava, Riga, Tallinn, and Ljubljana. Kraków is one of the leading centers of economic activity in Poland and one of the most attractive cities in the world for establishing business services centers (Tholons Services Globalization City Index, 2019). It features almost 80,000 personnel employed at 234 business services centers and is known as the European capital of outsourcing. Given its unique urban characteristics and architecture as well as global relevance it is today one of the most recognizable tourist destinations in Europe and the world (Kruczek & Mazanek 2018). In 2019 it was visited by 14 mln domestic and foreign tourists (*Kraków w liczbach*, 2020). Kraków is not only highly ranked in terms of domestic cultural sites in Poland but also in terms of European and world cultural sites. About 150,000 university students call Kraków home. Its academic traditions reach back centuries (Raport o stanie miasta, 2019). In addition, many graduates choose to stay in the city following graduation in order to seek out jobs in the local job market. Once they attain a certain social standing and start a family, many city residents choose to move to the suburbs. This explains the growing rate of suburbanization around Kraków that began in the 1990s and accelerated after the year 2000.

The city of Tarnów and its extensive commuter zone have a population of more than 270,000 (Table 2). It is the 17th largest city in Poland and a major cultural center with a well-preserved, medieval urban core and a wealth of valuable architectural sites. The city is also called the Pearl of the

Renaissance. Tarnów is also a major economic center in southern Poland featuring advanced industries (Grupa Azoty – large manufacturer of chemicals) and innovative industries part of the Plastics Valley industrial cluster and the Research and Development Park. It is also an important center of learning and research at the subregional level – featuring four institutions of higher learning. The city is furthermore an automobile transportation hub and a major railway hub, which helps facilitate commuting to work and to services centers in the central city by suburban residents. As a major industrial center, Tarnów experienced substantial restructuring of the industrial sector during Poland's economic transformation of the 1990s. In effect this led to a loss of jobs and subsequently some degree of depopulation in the city.

The third studied urban region is the city of Nowy Sącz – located in the southern part of Małopolska Province in the Sądecka Kotlina Basin, which is part of the Beskidy Mountains in southern Poland. Poland's border with Slovakia is found only about 25 km away. The city is home to 84,000 residents and is surrounded by an urban impact zone home to almost 150,000 persons (Table 2). Nowy Sącz is considered to be one of the most important administrative and cultural as well as educational centers in southern Poland – it is home to three institutions of higher learning. Furthermore, the city is a key center of business with a total of 34,000 workers (LDB, 2019). Several national highways and railways also meet in the city.

The study was conducted based on two types of spatial units – townships, called gminas in Poland, and functional-spatial zones in urban regions consisting of the suburban zone and commuter zone, considered to be identical with the peri-urbanization zone of central cities, in this case Kraków, Tarnów, and Nowy Sącz (Table 2).

3.2. Data and methods

Our study of urban decentralization processes involved the use of two indices:

- The first index is the net migration rate defined as the difference between the number of in-migrants and number of out-migrants for a given gmina divided by its population and expressed per 1,000 residents. Given the need to limit the impact of short-term (i.e. annual) fluctuations that may affect the rate value and distort general trends, it was calculated as an average annual rate for consecutive 2-year periods based on gmina population as of December 31st of the first of the two years. Net migration rate values were calculated for the following 2-year periods: 1995/1996, 2001/2002, 2007/2008, 2013/2014, 2016/2017. This rate applies to the overall number of migrants entering and leaving a given gmina – and does not explain their place of origin or destination. Thus the inflow of population to a given zone in the urban region is the sum of inflows from

Table 2. Population in the urban regions of Kraków, Tarnów, and Nowy Sącz (2019)

Urban regions	Population in 2019	Number of gminas (local administrative units)
Kraków	779,115	1
suburban zone of Kraków	296,271	12
commuting / peri-urban zone of Kraków	471,737	39
urban region of Kraków (total)	1,547,123	52
Tarnów	108,470	1
suburban zone of Tarnów	85,638	5
commuting / peri-urban zone of Tarnów	77,481	7
urban region of Tarnów (total)	271,589	13
Nowy Sącz	83,794	1
suburban zone of Nowy Sącz	85,076	5
commuting / peri-urban zone of Nowy Sącz	61,281	6
urban region of Nowy Sącz (total)	230,151	12
Małopolska Province (total)	**3,410,901**	**182**

Source: Author's own work based on data from Poland's Central Statistical Office.

the central city and from any gminas situated outside the given urban region. The same pattern holds true for population outflows. The decentralization processes studied via this rate (suburbanization, peri-urbanization) may be considered decentralization processes in a relatively broad sense.

- It is also important to examine decentralization processes in a narrowly defined sense, both suburbanization and peri-urbanization. In order to achieve this goal, research was performed to examine the inflow of population from the central city to each studied zone of the urban region in each studied gmina in relation to total population inflow. The metric used to study this process was the net percent share of migration between the central city and each given gmina in net total migration for that gmina. This percentage share was examined for gminas in Małopolska Province and individually for selected zones in the three studied urban regions. In the latter case, the percentage share was analyzed for every year for the period 1990–2017.

The same metrics were used to examine migrations in the three selected urban regions (Kraków, Tarnów, Nowy Sącz, with a focus on zones: central city, suburban zone, peri-urban zone) as well as all other gminas in Małopolska Province. This helped produce a broader base for comparative purposes and for placing urban decentralization within the context of spatially expansive urbanization patterns present also in smaller urban centers in the studied province.

The study was based on source materials covering internal, permanent migrations and population totals for gminas in Małopolska Province. These data were obtained from Current Population Records generated by the Central Statistical Office (CSO) of Poland and were then published in Local Data Banks.

The size of migratory flows in Poland directly depends on the definition of internal migration adopted by the Polish Central Statistical Office (Polish acronym: GUS). Migration is defined as:

Change of place of residence (permanent or temporary) in the territory of Poland, related to crossing the administrative border of a gmina, including - in the case of urban-rural gminas - changes in the place of residence within a gmina, i.e. from rural to urban areas and vice versa. Arrival (i.e. registration) in a given administrative unit with the purpose of residing there is called a migration inflow, while a departure with the purpose of residing in another administrative unit is called migration outflow (CSO, 2021, https:stat.gov.pl/).

Hence, frequent intra-city migrations from the central urban core or large housing estates to suburbs located within the administrative area of the same city are not accounted for in the official migration statistics. This leads to an understatement of the number of migrants in Poland, in particular that associated with suburbanization. This means of collecting data on internal migrations is similar to methods used in this area in other countries in Central Europe (Novotný, 2016).

The data were then used to produce a graph and series of choropleth maps providing a spatial picture of suburbanization and peri-urbanization in Małopolska Province.

4. Results: suburbanization and peri-urbanization in Małopolska Province

As elsewhere across Poland (Zborowski et al., 2012, Gałka & Warych-Juras, 2018) suburbanization in Małopolska Province began to have a significant impact on the redistribution of population and functional and spatial changes in the 1990s. In demographic terms, they were manifested at that time by the emergence of large migrations from the central city to growing suburban municipalities. Out-migrations first began in Kraków, and then in cities, e.g., Tarnów, Nowy Sącz, and Oświęcim (Fig. 2A). The suburbanization and peri-urbanization migration processes observed at the time were characterized by variable intensity and revealed unique features of the areas into which urban populations had dispersed. In the first half of the 1990s, the population flow from the city of Kraków to the nearby countryside was directed towards selected suburban municipalities found immediately adjacent to the city and characterized by good transportation linkages with the central city (Fig. 2A).

These were mainly municipalities located north and west of the urban core. Towards the end of the 1990s, intensified inflows of former Kraków residents into gminas in the southern suburban belt translated into increases in the area's net migration rate. Another very important characteristic of these migrations was their occurrence in municipalities not adjacent to the city (second ring of municipalities, i.e., commuter/peri-urban zone), which meant intensified, large-scale urban sprawl spanning a belt of 20 to 30 km from the administrative boundary of Kraków (Fig.

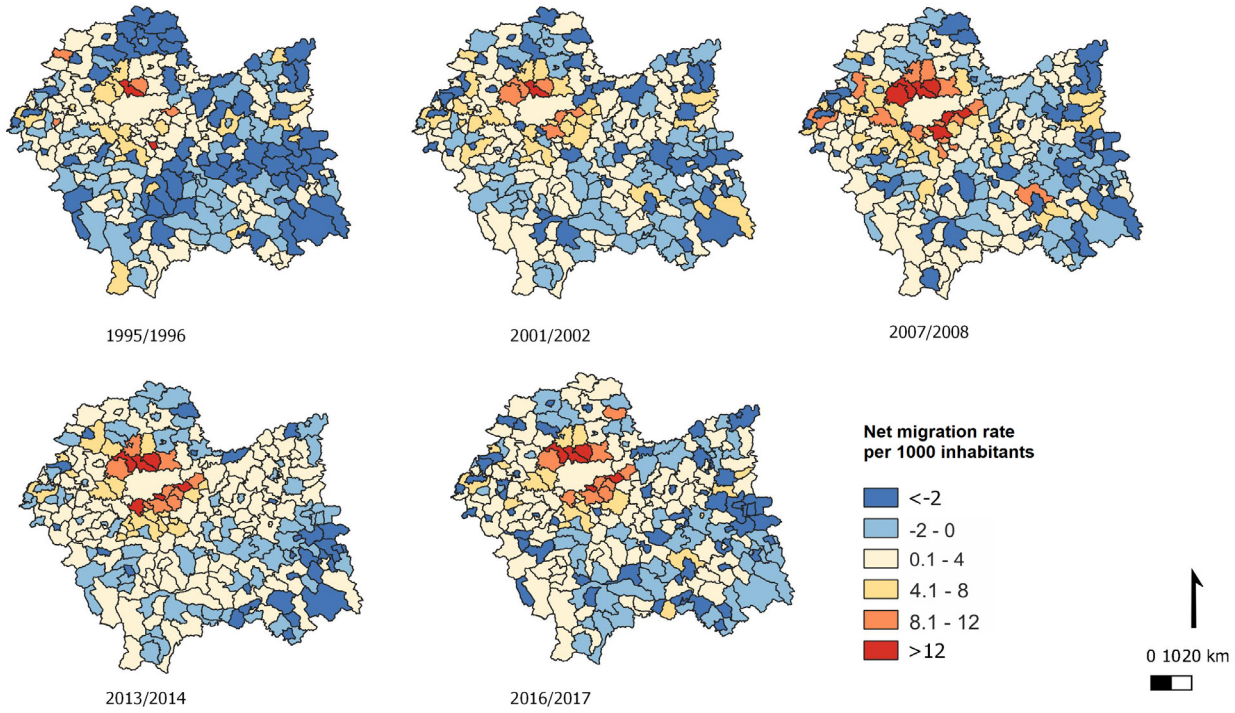

Fig. 2. Net migration rate per 1,000 inhabitants in Małopolska Province in 1995/1996, 2001/2002, 2007/2008, 2013/2014 and 2016/2017

2B). The co-occurrence of suburbanization and peri-urbanization was observed at the time.

As elsewhere across Poland (Zborowski & Raźniak 2013; Kurek et al., 2020) and in other post-socialist countries in Europe (Stanilov & Hirt, 2014), decentralization processes in the urban area of Kraków exhibited the greatest intensity in the years 2007/2008 (Fig. 2C). At the time, the net migration rate between urban and rural areas peaked over a vast area formed by the municipalities of Kraków's suburban and commuting zones, which meant that both suburbanization and peri-urbanization affected the entire Kraków Metropolitan Area. In the western part of Małopolska Province, suburban and peri-urban areas of the Kraków urban region linked with smaller peri-urban areas of midsize towns such as Oświęcim, Olkusz, and Chrzanów. In the eastern part of the region, suburbanization and peri-urbanization processes were observable in areas surrounding the cities of Tarnów and Nowy Sącz (Figs. 2C).

In the following years, a number of the issues discussed below hampered the spread of the studied processes, decreasing their intensity, even in the case of municipalities adjacent to cities. However, the abovementioned reduction in the intensity and spatial extent of the said processes was not evenly distributed across Małopolska Province or the Kraków Metropolitan Area. This reduction was largest in the urban effect zones of midsize towns with a population of around 20,000 (Fig. 2D). There was also a decline in the net migration rate in the gminas of the suburban areas of Kraków, Tarnów, and Nowy Sącz (Figs. 2D and 2E). In addition, the share of former Kraków residents in the total migrant inflow to suburban areas decreased from 62.2% to 50.5% in the years 2004-2017 (Fig. 3). However, the same time period experienced reverse migration trends across commuter/peri-urban zone municipalities, which saw a rise in the share of former Kraków residents in the total population inflow into these gminas (Fig. 3) from 27.5% in 2008 to 32.4% in 2011.

General tendencies in suburbanization and peri-urbanization in Poland were affected by broader political and economic events including the country's entry into the European Union in 2004 and the global economic crisis in 2008. The share of central city residents migrating to suburban areas rapidly declined after 2004 in the case of Kraków and Tarnów. Global crises and other global changes had less of an impact on peri-urbanization in the three studies areas. One potential explanation for this difference was the younger age of migrants leaving central cities to settle in suburbs versus those settling in peri-urban areas (Kurek et al., 2014). Younger city dwellers were more likely to emigrate to Western Europe following Poland's

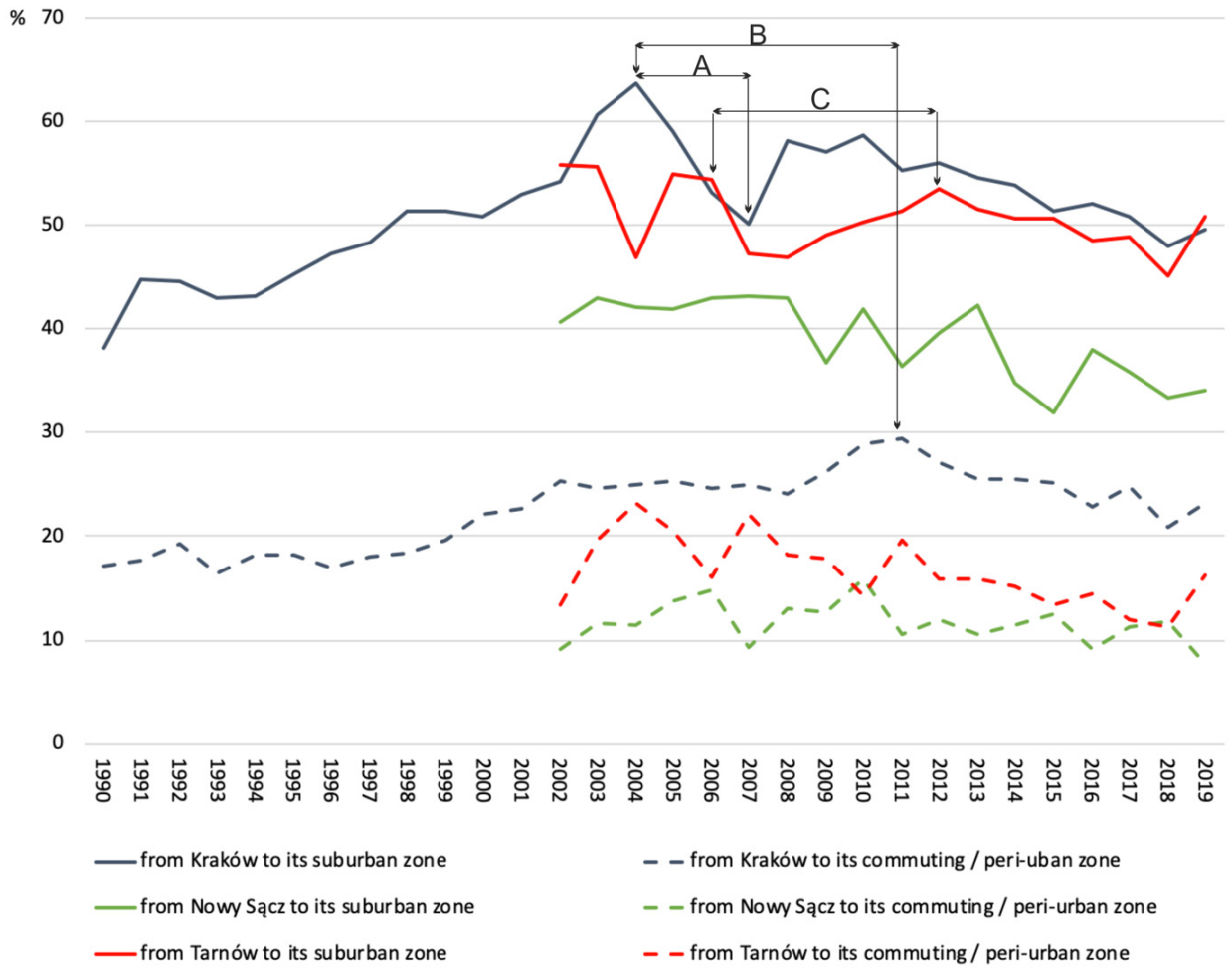

Fig. 3. Changes in the share of population inflows from Kraków, Nowy Sącz, and Tarnów to suburban and commuting zones in total population inflows in each zone in 2002-2017
A – decline in the share from Kraków due to increased emigration to Western Europe after Poland's entry into the EU
B – temporary shift in the maximum share of inflows from Kraków between different zones
C – decline in the share of inflows from Tarnów due to increased emigration to Western Europe after Poland's entry into the EU and the global financial crisis of 2008
Source: Author's own work based on data from Poland's Central Statistical Office and Kurek et al. 2014.

EU entry than their older neighbors who tended to migrate to domestic peri-urban areas. Thus migrations to the suburbs were succeeded at this time by migrations abroad. Similar succession patterns were also observed in East German cities, where the rate of suburbanization was limited by migrant outflows from eastern German states to western German states (Nuissl & Rink, 2005).

In the years 2002-2017 a particularly large increase in the population inflow from Kraków was recorded by gminas in the second ring (Fig. 4), e.g. Municipality of Skała (from 15.6% to 53.5%), Jerzmanowice-Przeginia (from 7.0% to 30.1%), and Gdów (from 22.3% to 43.0%). This means that the area experiencing the urban effects of Kraków saw a slowdown in suburbanization, as opposed to peri-urbanization, which grew in intensity.

This apparent divergence between suburbanization and peri-urbanization may have been caused by a number of social, financial, and economic factors. In the studied suburbanization area, after more than 20 years of intense decentralization processes that involved an increased intensity of housing development activity focused on the studied suburban zone (see also: Wójtowicz et al., 2014), a lack of larger undeveloped areas for new construction projects was observed. This led to an increase in prices in suburban residential areas and consequently made residents

search for construction land in more remote peri-urban areas, which drove prices up in the latter as well, especially in areas with good access to Kraków along key transportation routes (Mika, 2019). In the period 2002–2012 the price of construction plots in the suburbs increased 3 to 5 times depending on transportation accessibility (Musiał-Malago, 2014).

The movement of urban residents to the peri-urban zone was also confirmed by a large increase in the number of commuters in Kraków, which follows from the fact that populations migrating to this zone do not break off their ties with Kraków as a city offering a large selection of well-paid jobs. In the period 2006–2011 commuting to work in Kraków grew from 58,400 to 91,300 persons (Guzik, 2015) due to increased quality of regional and local roads, leading to a rise in the development of residential suburbs around the city. Increased suburbanization due to a rise in the quality of transportation options has been shown by a number of studies in the United States (Duranton & Turner, 2012), Western Europe (Oueslati et al., 2015), and Central and Eastern Europe (Novotny, 2016).

Such linkages with the central city are also maintained by young people who commute to Kraków schools (Kurek et al., 2014). The decline in the suburbanization rate, on the one hand, and intensification of peri-urbanization, on the other, may also be explained by a stricter credit policy of banks (Bień, 2011). The non-availability of a large loan forces those who want to live outside the city to look for cheaper land, which is usually located at a considerable distance from the city (Mika, 2019). The increase in the number of younger retirees, such as post-war baby boomers who represent a growing subpopulation in cities, willing to move out of the city is an additional driver of the boom in the real estate market. This social group would rather look for older, but cheaper houses, which they could renovate on a do-it-yourself basis, doing a large proportion of the work on their own. Because pensioners do not need daily contact with the city, they are more likely to look for land at a greater distance from the urban core, which drives demand for land and buildings in the city's peri-urban area (Pytel & Rahmanov, 2018).

Some of these migrants moved to the foothills and low mountains located south of the city to second homes. This type of peri-urbanization is termed anti-urbanization. It is promoted by residential migrants who prefer the absence of urban noise and a rural environment that can provide them with high environmental value (Zasada, 2011).

The question that remains to be answered is the following: Why are peri-urbanization processes in the Kraków Metropolitan Area on the rise, while the same processes in the other subregions of

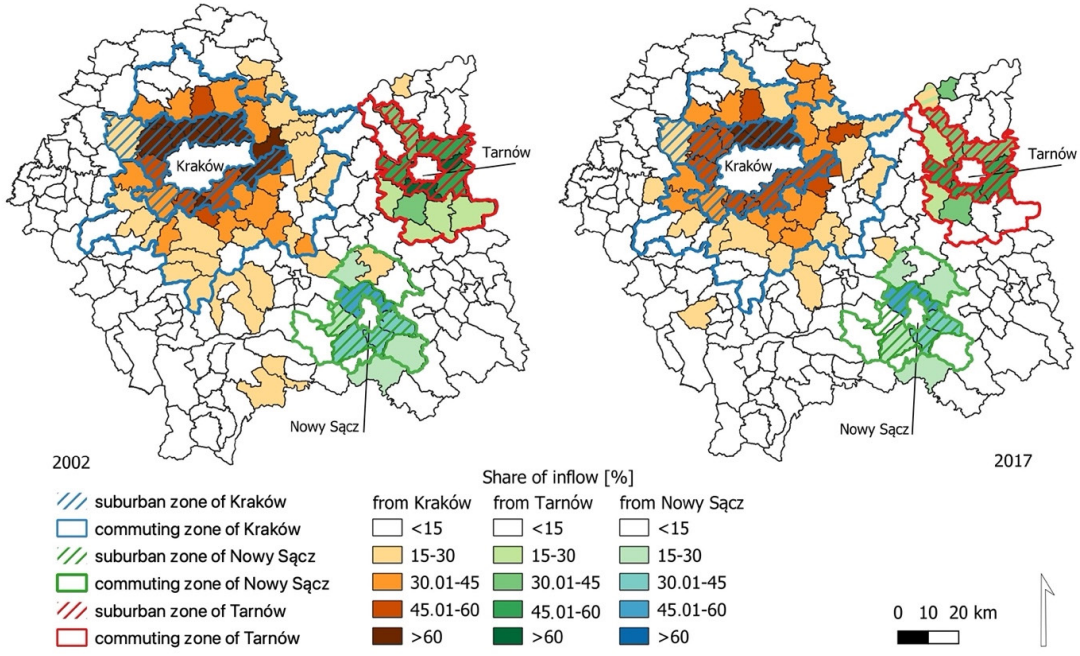

Fig. 4. Share of population inflow from Kraków, Nowy Sącz, and Tarnów in total population influx in the years 2002 and 2017

Source: Author's own work based on data from Poland's Central Statistical Office.

Małopolska Province have clearly decelerated? There are several factors behind the slowdown in the rate of peri-urbanization. First, like elsewhere across Poland, the transient acceleration of suburbanization and peri-urbanization in midsize towns in Małopolska Province was associated with consumer demand for foreign-currency mortgage loans leading up to the global financial crisis of 2008 (Willmann, 2013). After 2008, Polish banks began to apply a restrictive credit policy that limited the availability of mortgage loans. The new credit policy affected less affluent populations of midsize towns to a greater extent, which in turn greatly reduced mortgage amounts and reduced opportunities for buying land outside the city. It should be noted that most midsize cities and towns in Poland are former industrial centers – as is also the case with post-socialist cities in other countries in Central and Eastern Europe (Bole et al., 2020).

Source: Author's own work based on data from Poland's Central Statistical Office.

Deindustrialization and the transition to a post-industrial society led to a significant reduction in the number of jobs and increased unemployment (Stanilov & Sýkora, 2014) and consequently a decrease in the standard of living (Zborowski et al., 2012, Wichowska, 2021). These adverse trends have only began to decline in recent years. The lack of good industrial jobs triggered large-scale migrations to large cities, both Polish and foreign (Gałka, 2012). The migrants were mostly young people who could have stayed in their existing place of residence, and only move out of the city later, had they not been forced by circumstances to migrate. This flux of young people from midsize cities and towns to large cities thus reduced the number of potential migrants to the suburban and peri-urban zones of midsize cities.

Existing migration trends suggest that decentralization and urbanization/reurbanization processes will remain in place over the next few years, which means that the city will not be affected by deurbanization (Table 3). Hence, the urban region lifecycle in Kraków is mimicking urban growth patterns present in some metropolitan areas in Western Europe (Turok & Mykhnenko 2007; Kroll & Kabisch, 2012). However, one feature of the development of this urban region makes it different from other large, post-socialist cities. In Kraków, after almost 30 years of decentralization, this process does not seem to be slowing down, as was the case with many other urban regions in Central and Eastern Europe (Leetmaa & Tammaru, 2007; Kabisch et al., 2010; Ouředníček et al., 2015).

The two other studied urban regions are characterized by a different development path (Table 3). As in the case of many other midsize cities in Central and Eastern Europe, they are characterized by weaker decentralization whose spatial extent is limited. Peri-urbanization was present in these cases for a short period of time, while suburbanization did not recover from the global financial crisis of 2008 and is now in a state of stagnation (Fig. 5). The city of Tarnów has in fact exhibited some signs of deurbanization. Unlike in the case of Kraków, the two other central cities do

Table 3. States (stages) of development in the urban regions of Kraków, Tarnów, and Nowy Sącz according to the 4-state and 5-state models[1)]

Urban region	Model type	1995	2002	2007	2013	2017
Kraków	4-state[2)]	S	S	S	S	S
	5-state[3)]	U/S/P	U/S/P	S/P	S/P	S/P/R
Tarnów	4-state	S	S	S	S	D
	5-state	S	S/P	S/P	S	S/D
Nowy Sącz	4-state	U	S	S	S	S
	5-state	S	S	S	S/P	S/D

Explanations: states (stages): U – urbanization, S – suburbanization, P – peri-urbanization, D – deurbanization, R – reurbanization[4)]

1. the model was created for the total migration index calculated for each zone of the urban region separately for the 4-state model and 5-state model
2. in the 4-state model two zones of the urban region are considered: urban core and hinterland (suburban zone and peri-urban zone)
3. in the 5-state model three zones of the urban region are considered: urban core, suburban zone, peri-urban zone
4. the states of the model were determined using Table 2
5. Source: Author's own work

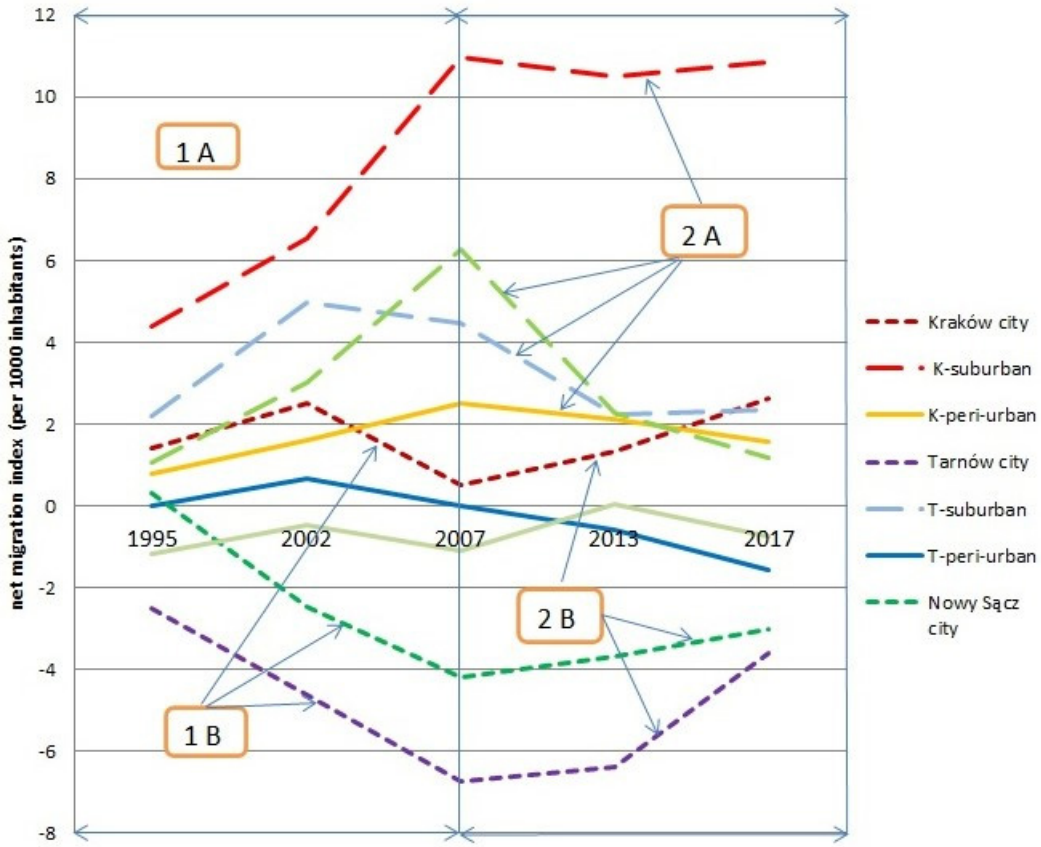

Fig. 5. Model (course) of decentralization (suburbanization and peri-urbanization) in the urban regions of Kraków, Tarnów, and Nowy Sącz (1995-2017)
1 A - progression of suburbanization and partially peri-urbanization in parallel with 1 B - central city stagnation (Kraków) or depopulation (Tarnów and Nowy Sącz)
2 A - stagnation and regression of suburbanization and peri-urbanization in parallel with 2 B - partial reurbanization (Kraków) and "return to the central city" (Tarnów and Nowy Sącz)
Source: Author's own work based on data from Poland's Central Statistical Office

not seem to yield any evidence of reurbanization due to a number of economic and social reasons. These include few higher order services in the two cities, few yuppies who prefer central districts, and few suburban residents wishing to return to the central city. These cities are following a path established by many second-tier cities in Europe – a path of decline in the population of the central city (Turok & Mykhnenko, 2007). On the other hand, both Nowy Sącz and Tarnów are quite capable of attracting new residents to their suburbs – residents from outside their own urban regions. This means that these central cities are losing some residents, but also gaining some residents in their suburban zones, which is the case with many Central European urban centers (Ouředníček, 2007) and cities in the West (Fisher, 2003).

5. Discussion

The literature on the subject of interest and analysis provided in the present study point to the existence of urban decentralization processes in the three primary peripheral zones of the urban area of Kraków (Zborowski, 2005). The old suburban zone sees internal suburbanization – one that takes place within the city's administrative boundaries. This type of suburbanization is mentioned in passing in this paper. The outer (new) suburban zone, which is located outside of city boundaries, sees intensifying suburbanization and peri-urbanization. Peri-urbanization is noted within the commuting/peri-urban zone around Kraków, with scattered small exurban enclaves within the zone, i.e., usually clusters of several or a dozen or so detached houses that stand out in the rural scenery for their "urban

style," and high-density clusters typical of housing estates erected by developers. The three zones are distinguished by their physical appearance, size of building plots, type and quality of technical infrastructure, and social stratification of residents. This means that the closer a given zone lies to the city core, the smaller the building plots. The minimum plot size ranges from 200 to 300 m2, with plots in peri-urban areas having an average size over 10,000 m2 (Kucharczyk, 2012). The farther away from the urban core, the more farmland there is, with typical farms and fewer villages with full technical infrastructure, and in particular buildings linked with the sewerage network. The farther away from the central city, the lower the educational attainment among those residents who are not part of the newly emerging middle or upper class (Szymańska & Biegańska, 2012).

It follows from the above analysis that suburbanization and peri-urbanization processes overlap within Kraków's zone of urban impact. This is most noticeable in the commuting zone, where strong peri-urbanization processes related to the influx of residents from Kraków may be observed. In this zone, within areas of influence of small towns, suburbanization processes may also take the form of migration from these towns to their suburban, single-family home, residential areas. As shown by Kurek et al. (2014) about 40% of migrants moving out of small suburban towns near Kraków choose to settle in nearby villages. This creates a pattern of local suburbanization in the peri-urban zone around Kraków. Notably, in the commuting zone, there are also relatively large migrations between local villages, mainly for matrimonial purposes. This follows from a study by Kurek et al. (2014), according to which intermunicipal migrations within the commuting zone account for as much as 23.4% of total migration flows. This type of migration is called tangential migration by M. Ouředníček (2007).

Hence, it may be argued that there exist a number of different migration fluxes in the Kraków suburban zone and commuting zone. The same migration patterns were identified in peri-urban areas in the course of studies on urban migration systems in Western Europe as well as those in Central and Eastern Europe (Tammaru, 2001; Fischer, 2003; Ouředníček, 2007). However, the authors did not examine migration flows in urban regions divided into suburban and commuting zones, but instead chose to treat both zones as one zone – the peri-urbanization zone. The introduction of two peripheral zones outside of city limits provides a more complete picture of variances in urban effects in terms of both suburbanization and peri-urbanization intensity.

As expected, the urban effect of Kraków is stronger in the suburban zone, as around 50% of all population inflows in this zone come from the central city, while in the commuting zone it is about 30% (Fig. 3). This also means that other types of migration play a significant role in the commuting zone, where peri-urbanization is a highly relevant process. These other types include migrations between villages and small towns, which are often related to marriage. This type of migration occurs much more often in the suburban zone of subregional cities such as Tarnów and Nowy Sącz and is observed in the outer zones of other cities in both Central and Eastern Europe (Biegańska et al., 2018) as well as in Western countries (Fisher, 2003).

Midsize cities in the Małopolska region also experience another type of process, which was identified for Eastern German cities in the former DDR by S. Schmidt (2011). This process is known as sprawl without growth and it is present in many post-communist states in Europe (Taubenböck et al., 2019). This type of sprawl is mostly found in post-industrial, midsize cities that are shrinking in size. The same processes affect some midsize towns in the western part of the Małopolska region (Chrzanów, Oświęcim, Olkusz) as well as the city of Tarnów, with more than 100,000 inhabitants, which is experiencing substantial shrinkage in the urban core as well as strong decentralization.

Similar contrasts in urban development in post-communist cities have been observed in many other countries in Central and Eastern Europe (Hirt, 2007; Schmidt 2011). Observations focused primarily on capital cities and other large cities versus smaller cities and towns. This disproportion in the urban system is perceived to be a legacy of the communist era in the region in that the communist governments of countries in this part of Europe favored capital cities and other key cities in terms of industrial investment and construction of infrastructure. This type of spatial concentration was designed to achieve higher efficiency in the industrial production sector – or in other words economies of scale (Taubenböck, 2019).

In terms of the evolution of suburbanization and peri-urbanization processes, the entire Małopolska Province may be divided into two subareas: (1) municipalities that are part of the Kraków Metropolitan Area, (2) other areas in the region. In the former subarea, suburbanization and peri-urbanization processes began in the early 1990s and were characterized by high rates of change and high intensity. In the other areas of Małopolska Province,

suburbanization and peri-urbanization are much less dynamic, especially after 2008.

Studies conducted in Poland (Biegańska et al., 2018; Kurek et al., 2020) and in other post-socialist countries (Cirtautas, 2013; Grigorescu et al., 2015) have shown that ultimately there are two suburbanization and peri-urbanization realities in Central and Eastern Europe, one of which is represented by large monocentric metropolitan areas with dynamic suburbanization processes. The second is represented by the post-industrial, polycentric Katowice conurbation (Krzysztofik et al., 2017) and areas under the influence of midsize and small cities, where the processes in question are also present, but their spatial scale and intensity are much smaller than those observed in major metropolitan areas (Szymańska & Biegańska, 2012; Biegańska et al., 2018).

Suburbanization processes were observed in all three studied urban regions despite the fact that rates of decentralization were found to vary. On the other hand, peri-urbanization was observed on a larger scale only in the Kraków urban region. This process was observed in the other two studied cities on a larger scale only in the early 2000's mainly due to their relatively low migration potential. In Tarnów this process was additionally hampered by significant rates of emigration to foreign countries throughout the study period (Gałka, 2017).

The use of the Klaassen and Paelinck urban lifecycle model (1981) and van den Berg model (1982) along with the expanded model proposed herein by the authors (5-stage model) made it possible to conduct a more thorough analysis of decentralization processes in the post-socialist city. The use of a 5-stage or 5-state model helped identify key differences between the Kraków metropolitan area and the urban regions of Tarnów and Nowy Sącz in terms of the area of decentralization and potential development trajectories in this area (Table 3). It is noteworthy that the classic 4-stage model does not identify any differences between the three studied areas in terms of decentralization. According to this model, all three studied urban regions were found in the suburbanization stage, except for Tarnów in 2017 when it was determined to be in the deurbanization stage.

The 5-state model revealed a high stability of the rate of change in decentralization and its duration in the Kraków metropolitan area. Since 1995 the region has experienced two states of the five possible states at the same time – suburbanization and peri-urbanization (Fig. 5). In some years it also experienced urbanization (1995 and 2002) and peri-urbanization (2017). It must also be noted that narrowly-defined peri-urbanization became shifted in time relative to narrowly-defined suburbanization by almost 10 years (Fig. 3). However, both broadly-defined suburbanization and peri-urbanization occurred at the same time (Table 3). This means that the inflow of population to the peri-urban zone in the first decade of Poland's political and socio-economic transformation was largely driven by migration from outside the Kraków urbanized area. The same type of observation may be made with respect to other large, monocentric urban areas in Poland (Kurek et al. 2020), large urban regions in Central Europe (Ouředníček, 2007), and large urban regions in Eastern Europe (Gnatiuk, 2017). The peri-urban zone experienced an influx of population from rural areas and smaller towns characterized by poorer economic conditions that sought to find work in a large city. These new residents wished to maintain their rural-type lifestyle and continue to live in a rural landscape in their new place of residence.

6. Conclusions

The study showed the need to further modify the existing 4-stage urban lifecycle model produced by Klaasen and Paelinck (1981) and van den Berg (1982) in recognition of the many limitations associated with its use, which have been already extensively studied (Haase et al., 2010). However, in heuristic form, this model may be reconceptualized in line with changes occurring in the distribution of population in urban areas. This model was used to identify the occurrence of decentralization reaching as far as the commuter zone (peri-urbanization), which further warrants the use of a 5-state model of the urban region lifecycle. The use of the newer model expands possibilities for deeper interpretation of the redistribution of population in the urban region.

The use of the 5-state model has shown that processes in the post-socialist city are not limited to suburbanization, which has already been the subject of study in many post-socialist countries. Central cities across the world are experiencing expansion into peripheral areas. This expansion requires further research at both the quantitative level and qualitative level. Studies of this type would help identify similarities and differences at the development level as well as the structural level between key urban regions in Central and Eastern Europe, Western Europe, and in global urban systems.

The research has shown that all processes part of the urban lifecycle (i.e. urbanization, suburbanization, deurbanization, reurbanization, and our own contribution: peri-urbanization) do not occur in a sequence in the studied urban regions. Hence, they may not be understood as stages of urban development, but rather states of urban development that a city experiences on its path to development. These states tend to occur in combinations of two or three, as in the case of Kraków. There exists a significant probability that up to four of the abovementioned processes may occur in Kraków at the same time sometime in the future – the only process not expected to occur is deurbanization. These conclusions are consistent with ideas published by a variety of researchers studying the post-socialist city (Haase et al., 2010; Ouředníček et al., 2015).

The paper proposes the study of two types of migration measurements used to evaluate decentralization processes. The first metric is broad-based migration that includes all forms of migration in suburban and peri-urban areas. The second metric is narrowly-defined migration, which focuses only on migrations from the central city and their share in total migration in a given area of the urban region. This division makes reference to some extent to different types of urban fringe migrations described by Tammaru (2001). Careful consideration of these two types of urban fringe migration leads, in our view, to a deeper understanding of the real impact of the central city on its surroundings.

It is important to remember that the migration change patterns presented in the current study for post-socialist cities on the basis of the urban region lifecycle are applicable to Central and Eastern Europe, a region affected by major changes in all walks of life including social and economic aspects and key elements of daily life (Hamilton et al., 2005; Sykora & Bouzarovski, 2012) as well as changes associated with the second demographic transition (van de Kaa, 1987; Sobotka, 2008). Thus, a deeper qualitative analysis (and possibly quantitative analysis) should examine population aging, principles of family formation, new forms of community life, low birth rates, high geographic mobility of society as well as foreign migration along with foreign immigration to the EU driven by a variety of global social and economic factors impacting the modern world.

References

Antrop, M. (2004). Landscape change and the urbanization process. *Europe Landscape and Urban Planning* 67: 9–26. DOI: https://doi.org/10.1016/S0169-2046(03)00026-4.

Arapoglou, V.P. & Sayas, J. (2009). New facets of urban segregation in southern Europe—Gender, migration and social class change in Athens. *European Urban and Regional Studies*, 16(4): 345–362. DOI: https://doi.org/10.1177/0969776409340187.

Berg, L. van der, Drewett, R., Klaassen, L.H., Rossi, A. & Vijverberg, C.H.T. (1982). *Urban Europe, vol. 1: A Study of Growth and Decline*. Oxford: Pergamon.

Biegańska, J., Środa-Murawska, S., Kruzmetra Z. & Swiaczny F. (2018). Peri-urban development as a significant rural development trend. *Quaestiones Geographicae*, 37(2): 125-140.

Bień, A. (2011). Stabilność systemu bankowego w okresie kryzysu finansowego (Stability of the banking system during the financial crisis- in Polish). *Studia i Prace Kolegium Zarządzania i Finansów*, 109: 16-30.

Bole, D., Kozina, J. & Tiran, J. (2020). The socioeconomic performance of small and medium-sized industrial towns: Slovenian perspectives. *Moravian Geographical Reports*, 28(1): 16–28. DOI: https://doi.org/10.2478/mgr-2020-0002.

Bourne, L.S. (1996). Reinventing the Suburbs: Old Myths and Realities. *Progress in Planning*, 46: 163–184. DOI: https://doi.org/10.1016/0305-9006(96)88868-4.

Brade, I., Herfert, G. & Wiest, K. (2009). Recent trends and future prospects of socio-spatial differentiation in urban regions of central and eastern Europe: a lull before the storm? *Cities*, 26: 233–244.

Bryant, C., Russwurm, L.H. & McLellan, A.G. (1982). *The City's Countryside: Land and its Management in the Rural-Urban Fringe*. London and New York: Longman.

Champion, T. (2001). Urbanization, suburbanization, counterurbanization and reurbanization. *Handbook of urban studies*, 160(1): 143-61.

Cheshire, P. (1995). A new phase of urban development in Western Europe? The evidence for the 1980s. *Urban Studies*, 32(7): 1045–63.

Cheshire, P.C. & Hay, D.G. (1989). *Urban Problems in Western Europe: An Economic Analysis* (1st ed.). Routledge. DOI: https://doi.org/10.4324/9781315100203.

Cirtautas, M. (2013). Urban Sprawl of Major Cities in the Baltic States. *Architecture and Urban Planning*, 7: 72-79. DOI: 10.7250/aup.2013.009.

Duranton, G. & Turner, M.A. (2012). Urban Growth and Transportation. *The Review of Economic Studies*, 79(4),

1407-1440. DOI: http://dx.doi.org/10.1093/restud/rds010.

Ekers, M., Hamel, P. & Keil, R. (2012). Governing Suburbia: Modalities and Mechanisms of Suburban Governance. *Regional studies*, 46(3): 405-422, DOI: 10.1080/00343404.2012.658036.

EUROSTAT (2010). Regional Yearbook 2010, EUROSTAT, Luxembourg. Available at: https://ec.europa.eu/eurostat/web/products-statistical-books/-/KS-HA-10-001.

Ferenčuhová, S. (2016). Accounts from behind the Curtain: History and Geography in the Critical Analysis of Urban Theory. *International Journal of Urban and Regional Research*, 40: 113-131. DOI: https://doi.org/10.1111/1468-2427.12332.

Fertner, C. (2012). Urbanisation, urban growth and planning in the Copenhagen Metropolitan Region with reference studies from Europe and the USA. *Forest & Landscape Research*, 54. Frederiksberg: Forest & Landscape Denmark, University of Copenhagen.

Fisher, T. (2003). Differentiation of growth processes in the peri-urban region: an Australian case study. *Urban Studies,* 40(3): 551-565. DOI: https://doi.org/10.1080/0042098032000053914.

Forsyth, A. (2012). Defining Suburbs. *Journal of Planning Literature*, 27(3): 270-281

Friedmann, J.& Miller J. (1965). The urban field. *Journal of the American Institute of Planners*, 31: 312-320.

Gałka, J. (2012). Polacy w przestrzeni społecznej Londynu u progu XXI wieku (Poles in the Social Space of London at the Turn of the 21st Century - in Polish). Instytut Geografii i Gospodarki Przestrzennej, Uniwersytet Jagielloński, Kraków, unpublished PhD thesis.

Gałka, J. (2017). Migracje zagraniczne w województwie małopolskim po akcesji Polski do Unii Europejskiej (Foreign migration in the Małopolska province after Poland's accession to the European Union- in Polish). *Sytuacja demograficzna Małopolski jako wyzwanie dla polityki społecznej i gospodarczej,* 123-151.

Gałka, J. & Warych-Juras, A. (2018). Suburbanization and migration in Polish metropolitan areas during political transition. *Acta Geographica Slovenica*, 58(2): 63–72. DOI: https://doi.org/10.3986/AGS.2256.

Gallent, N. (2006) The Rural–Urban fringe: A new priority for planning policy? *Planning Practice & Research*, 21(3): 383-393. DOI: 10.1080/02697450601090872.

Gant, R.L., Robinson G. M. & Fazal S. (2011). Land-use change in the 'edgelands': Policies and pressures in London's rural–urban fringe. *Land Use Policy*, 28: 266–279.

Gnatiuk, O. (2017). Demographic dimension of suburbanization in Ukraine in the light of urban development theories. *Acta Universitatis Carolinae. Geographica*, 52(2): 151-163, DOI: 10.14712/23361980.2017.12.

Grigorescu, I., Mitrică B. & Mocanu I. (2015). Assessing urban sprawl-related housing dynamics in the Romanian metropolitan areas. *Studia Obszarów Wiejskich*, 38: 145–164. DOI: http://dx.doi.org/10.7163/SOW.38.9.

Guzik, R. (2015). Dojazdy do pracy w województwie małopolskim 2006–2011 (Commuting in the Malopolskie Voivodeship 2006-2011 - in Polish). Wojewódzki Urząd Pracy w Krakowie, Kraków.

Guzik, R., Zborowski, A., Kołoś, A., Micek, G., Gwosdz, K., Trzepacz, P., Chaberko, T., Kretowicz, P., Ciechowski, M., Dej, M. & Grad, N. (2010). Dostępność komunikacyjna i powiązania miast oraz delimitacja obszarów Funkcjonalnych (Communication accessibility and urban linkages and delimitation of functional areas- in Polish). In: Domański, B., Noworól A., (2010). *Małopolskie Obserwatorium Polityki Rozwoju, Potencjał i trendy rozwojowe miast w województwie małopolskim*, 88-134.

Haase, A., Kabisch, S., Steinführer, A., Bouzarovski, S., Hall, R. & Ogden, P. (2010). Emergent spaces of reurbanisation: exploring the demographic dimension of inner-city residential change in a European setting. Popul. *Space Place*, 16: 443-463. DOI: 10.1002/psp.603.

Haase, A., Steinführer, A., Kabisch, S., Grossmann, K. & Hall, R. (2011). Residential Change and Demographic Challenge. *The Inner City of East Central Europe in the 21st Century*. Surrey/Burlington, Ashgate.

Haase, D. & Nuissl, H. (2007). Does urban sprawl drive changes in the water balance and policy?: The case of Leipzig (Germany) 1870–2003. *Landscape and Urban Planning*, 80: 1-13. DOI: 10.1016/j.landurbplan.2006.03.011.

Hamel, P., & Keil, R. (2016). Governance in an emerging suburban world. *Cadernos Metrópole*, 18: 647-670. DOI: 10.1590/2236-9996.2016-3702.

Hamilton, F.E., Andrews, K.D., & Pichler-Milanović, N. (2005). Transformation of cities in Central and Eastern Europe: towards globalization. (No Title).

Herington, J.M. (1984). *The Outer City*. Harper and Row, London.

Hirt, S. (2007). Suburbanizing Sofia: Characteristics of Post-Socialist Peri-Urban Change. *Urban Geography*, 28. 755-780. DOI: 10.2747/0272-3638.28.8.755.

Hirt, S. (2013), Whatever happened to the (post) socialist city?, *Cities*, 32(1): S29-S38. DOI: https://doi.org/10.1016/j.cities.2013.04.010.

Hoggart, K. (2005). *The City's Hinterland: Dynamism and Divergence in Europe's Peri-urban Territories*. Aldershot: Ashgate.

Kabisch, N., Haase, D. & Haase, A. (2010). Evolving Reurbanisation? Spatio-temporal Dynamics as Exemplified by the East German City of Leipzig. *Urban Studies*, 47(5): 967–990. DOI: https://doi.org/10.1177/0042098009353072.

Kaczmarek, T. & Mikuła Ł. (2019). The Housing Market in Poland in the Liberalized Spatial Planning System: the National Context and Metropolitan Dimension of the Poznań Agglomeration In: R. Wehrhahn, J. Pohlan, C. Hannemann, F. Othengrafen, B. Schmidt-Lauber (eds.), Housing and housing politics in European metropolises, Springer-Verlag, Berlin–Heidelberg.

Klaassen, L., Molle, W.T. & Paelinck, J.H. (1981). *Dynamics of Urban Development*. Gower, Aldershot.

Kok, H. & Kovács, Z. (2006). The process of suburbanization in the agglomeration of Budapest. *Journal of Housing and the Built Environment*, 14(2): 119-141.

Kovács, Z., Farkasc, Z. J., Egedya, T., Kondora, A. C., Szabóa, B., Lennert, J., Bakad, D. & Kohánd B. (2019). Urban sprawl and land conversion in post-socialist cities: The case of metropolitan Budapest. *Cities*, 92: 71–81). DOI: https://doi.org/10.1016/j.cities.2019.03.018.

Kraków w liczbach (2020). Urząd Miasta Krakowa, Kraków.

Krišjane, Z. & Berzinš, M. (2012). Post-socialist Urban Trends: New Patterns and Motivations for Migration in the Suburban Areas of Riga, Latvia. *Urban Studies*, 49(2): 289-306. DOI: https://doi.org/10.1177/0042098011402232.

Kroll, F. & Kabisch, N. (2012), The Relation of Diverging Urban Growth Processes and Demographic Change along an Urban–Rural Gradient. *Population, Space and Place*, 18: 260-276. DOI: 10.1002/psp.653.

Kruczek, Z. & Mazanek, L. (2018). Krakow as a Tourist Metropolitan Area. Impact of Tourism on the Economy of the City. *Studia Periegetica*, 2(26): 25-41.

Krzysztofik, R., Kantor-Pietraga I., Runge A. & Spórna T. (2017). Is the suburbanisation stage always important in the transformation of large urban agglomerations? The case of the Katowice Conurbation. *Geographia Polonica*, 2: 71-85. DOI: 10.7163/GPol.0082.

Kubeš, J. (2015). Analysis of regulation of residential suburbanisation in hinterland of post-socialist 'one hundred thousands' city of České Budějovice, *Bulletin of Geography. Socio-economic Series*, 27: 109–131. DOI: https://doi.org/10.1515/bog-2015-0008.

Kucharczyk, M. (2012). Analiza cech podmiejskiej zabudowy mieszkaniowej na przykładzie inwestycji deweloperskich realizowanych w okolicy Krakowa (Analysis of the features of suburban residential development on the example of development projects carried out in the vicinity of Kraków- in Polish). *Architektura Czasopismo Techniczne*, 29(109): 87-103.

Kurek, S. Gałka, J. & Wójtowicz, M. (2014). Wpływ suburbanizacji na przemiany wybranych struktur demograficznych i powiązań funkcjonalno-przestrzennych w Krakowskim Obszarze Metropolitalnym (The impact of suburbanization on the transformation of selected demographic structures and functional-spatial linkages in the Krakow Metropolitan Area- in Polish). *Prace monograficzne* 724.

Kurek, S., Wójtowicz, M. & Gałka J. (2020). *Functional Urban Areas in Poland. Demographic Trends and Migration Patterns*. The Urban Book Series, Springer.

Leetmaa, K. & Tammaru, T. (2007). Suburbanisation in countries in transition: Destinations of suburbanisers in the Tallinn metropolitan area. *Geografiska Annaler, Series B: Human Geography*, 89(2): 127–146.

Leetmaa, K., Tammaru, T. & Anniste, K. (2009), From Priority-Led To Market-Led Suburbanisation In A Post-Communist Metropolis. *Tijdschrift voor economische en sociale geografie*, 100: 436-453. DOI: 10.1111/j.1467-9663.2009.00551.x.

Lincaru, C., Atanasiu, D., Ciucă V. & Pirciog, S. (2016). Peri-urban Areas and Land Use Structure in Romania at LAU2, Level: An Exploratory Spatial Data Analysis. *Procedia Environmental Sciences,* 32: 124-137.

Madsen, M.F., Kristensen S.B.P, Fertner Ch., Busck, A.G. & Jørgensen G. (2010). Urbanisation of rural areas: A case study from Jutland, Denmark. *Geografisk Tidsskrift - Danish Journal of Geography*, 110(1): 47-63. DOI: 10.1080/00167223.2010.10669496.

Mayer, H., Habersetzer, A. & Meili, R. (2016). Rural-urban linkages and sustainable regional development: the role of entrepreneurs in linking peripheries and centers. *Sustainability*, 8: 745. DOI: https://doi.org/10.3390/su8080745.

Mika, P. (2019). Domy jednorodzinne w strefie podmiejskiej Krakowa (Single-family homes in Krakow's suburban zone- in Polish). Instytut Analiz -Monitor Rynku Nieruchomości, mrn.pl.

Morelli, V.G. & Rontos K. & Salvati L. (2014). Between suburbanisation and re-urbanisation: revisiting the urban life cycle in a Mediterranean compact city. *Urban Research & Practice,* 7(1): 74-88, DOI: 10.1080/17535069.2014.885744.

Musiał-Malago, M. (2014). Procesy suburbanizacji obszarów podmiejskich Krakowa (Suburbanization processes in suburban areas of Kraków- in Polish).

Zeszyty Naukowe Uniwersytetu Ekonomicznego w Krakowie, 936(12): 63-77.

Nelson, A.C. (1992). Characterizing Exurbia. *Journal of Planning Literature* 6(4): 350–368.

Nelson, A., & Sanchez, T. (1999). Debunking the exurban myth: A comparison of suburban households. *Housing Policy Debate*, 10(3): 689-709.

Novotný, L. (2016). Urban development and migration processes in the urban region of Bratislava from the post-socialist transformation until the global economic crisis. *Urban Geography*, 37(7): 1009-1029. DOI: 10.1080/02723638.2016.1139413.

Nuissl, H. & Rink, D. (2005). The 'production' of urban sprawl in eastern Germany as a phenomenon of post-socialist transformation. *Cities*, 22(2): 123-134.

Oueslati, W., Alvanides, S. & Garrod, G. (2015). Determinants of urban sprawl in European cities. *Urban Studies*, 52(9): 1594–1614. DOI: https://doi.org/10.1177/0042098015577773.

Ouředníček, M. (2007). Differential Suburban Development in the Prague Urban Region. *Geografiska Annaler: Series B, Human Geography*, 89(2): 111–126. DOI: https://doi.org/10.1111/j.1468-0467.2007.00243.x.

Ouředníček, M., Šimon, M. & Kopečná, M. (2016). The reurbanisation concept and its utility for contemporary research on post-socialist cities: The case of the Czech Republic. *Moravian Geographical Reports*, 23(4): 26–35. DOI: https://doi.org/10.1515/mgr-2015-0022.

Piorr, A. Ravetz, J. & Tosics, I. (2011). *Peri-urbanisation in Europe: Towards European Policies to Sustain Urban-Rural Futures*. A synthesis report, Academic Books Life Sciences, University of Copenhagen, Fredriksberg. Available at: http://www.openspace.eca.ed.ac.uk/wp-content/uploads/2015/12/Peri_Urbanisation_in_Europe_printversion.pdf.

Popescu, C. (2020). 'Back to the village': the model of urban outmigration in post-communist Romania. *European Planning Studies*, 28(6): 1200-1218.

Pytel, S., & Rahmonov, O. (2019). Migration processes and the underlying reasons: A study on pensioner migrants in Poland. *Population, Space and Place*, 25(3), e2197.

Raport o stanie Miasta. (2019). Urząd Miasta Krakowa, Kraków.

Ravetz, J., Fertner, C. & Nielsen T.S. (2013). The Dynamics of Peri-Urbanization. In: K. Nilsson, S. Pauleit, S. Bell, C. Aalbers, T.S. Nielsen (Eds.). *Peri-urban Futures: Scenarios and Models for Land Use Change in Europe*, Springer, Berlin-Heidelberg.

Reckien, D. & Luedeke, M.K.B. (2014). The Social Dynamics of Suburbanization: Insights from a Qualitative Model. *Environment and Planning A: Economy and Space*, 46(4): 980–1000. DOI: https://doi.org/10.1068/a4639.

Rontos, K., Mavroudis, Ch. & Salvati, L. (2011). Suburbanisation and Urban Growth: Revisiting the Life Cycle Hypothesis. Available at: http://www.grupposervizioambiente.it/aisre/pendrive2012/pendrive/Paper/Salvati_suburbanization_athens_ERSA.pdf (Accessed: 21 March 2021).

Rudolph, R. & Brade, I. (2005). Moscow: Processes of restructuring in the post-Soviet metropolitan periphery. *Cities*, 22(2): 135-150. DOI: 10.1016/j.cities.2005.01.005.

Schmidt, S. (2011). Sprawl without growth in East Germany. *Urban Geography* 32(1): 105–128. DOI: 10.2747/0272-3638.32.1.105.

Schmidt, S., Fina, S. & Siedentop S. (2015). Post-socialist Sprawl: A Cross-Country Comparison. *European Planning Studies*, 23(7): 1357–1380. DOI: https://doi.org/10.1080/09654313.2014.933178.

Shaw, B.J., van Vliet, J. & Verburg, P.H. (2020). The peri-urbanization of Europe: A systematic review of a multifaceted process. *Landscape and Urban Planning*, 196: 1-11, 103733. DOI: https://doi.org/10.1016/j.landurbplan.2019.103733.

Siekierski, J. (2010). Miejsce małych i średnich miast w rozwoju turystyki na przykładzie Tarnowa (The place of small and medium-sized cities in the development of tourism on the example of Tarnów- in Polish). *Acta Scientiarum Polonorum Oeconomia*, 9(4): 467–475.

Sieverts, T. (2003). *Cities without cities: between place and world, space and time, town and country*. Routledge, London

Sobotka, T. (2008)., The divers faces of the second demographic transition in Europe. *Demographic Research*, 19: 171-224. DOI: https://doi.org/10.4054/DemRes.2008.19.8.

Stanilov, K. & Hirt, S. (2014). Sprawling Sofia: Post-socialist Suburban Growth in the Bulgarian Capital. *Confronting suburbanization: Urban decentralization in postsocialist Central and Eastern Europe*, 163-191. DOI: 10.1002/9781118295861.ch6.

Stanilov, K. & Sýkora, L. (2014). *Confronting suburbanization: Urban decentralization in postsocialist Central and Eastern Europe*. Oxford: Wiley-Blackwell.

Sýkora, L. & Ouředníček, M. (2007). Sprawling Post-communist Metropolis: Commercial and Residential Suburbanisation in Prague and Brno, the Czech Republic, Employment Deconcentration in European Metropolitan Areas, Netherlands. DOI: 10.1007/978-1-4020-5762-5_8.

Sýkora, L. & Bouzarovski, S. (2012). Multiple Transformations: Conceptualising the Post-communist Urban Transition. *Urban Studies*, 49(1): 43–60. DOI: https://doi.org/10.1177/0042098010397402.

Szymańska, D. & Biegańska, J. (2012). Infrastructure's and housing's development in the rural areas in Poland – some problems. *Journal of Infrastructure Development* 4(1): 1–17. DOI: https://doi.org/10.1177/09749306124495.

Szymańska, D. & Matczak, A. (2002). Urbanization in Poland : tendencies and transformation. Urban and Regional Studies, 9(1): 39-46. http://repozytorium.umk.pl/handle/item/579?show=full DOI: https://doi.org/10.1177/096977640200 90.

Szymańska, D. (2007). Urbanizacja na świecie (Urbanization in the world - in Polish). Warszawa, Wydawnictwo Naukowe PWN.

Tammaru, T. (2001). Suburban growth and suburbanization under central planning: the case of Soviet Estonia. *Urban Studies,* 38(8): 1341-1357. DOI: 10.1080/00420980123612.

Taubenböck, H., Gerten C., Rusche K., Siedentop, S. & Wurm, M. (2019), Patterns of Eastern European urbanisation in the mirror of Western trends – Convergent, unique or hybrid? *Environment and Planning B Planning and Design*, 46(7): 1206–1225. DOI: https://doi.org/10.1177/2399808319846902.

Tholons Services Globalization City Index-2019. (2019). Innovation at Scale. Digital Nations and Super Cities, New York-London-Montevideo-Bangalore-Manila.

Turok, I. & Mykhnenko, V. (2007). The trajectories of European cities, 1960–2005. *Cities*, 24(3): 165–182.

Van de Kaa, D.J. (1987). Europe's second demographic transition. *Population bulletin*, 42(1): 1-55, 57.

Viganò, P. (2013). The Horizontal Metropolis and Gloeden's Diagrams. Two Parallel Stories. *OASE Journal of Architecture*, 89: 94-111.

Wichowska, A. (2021). Economic Aspects of Shrinking Cities in Poland in the Context of Regional Sustainable Development. *Sustainability*, 13: 3104. DOI: https://doi.org/10.3390/su13063104.

Willmann, M. (2013). Wpływ rekomendacji nadzorczych na kształtowanie się rynku kredytów mieszkaniowych w Polsce (The impact of supervisory recommendations on the formation of the housing loan market in Poland- in Polish). *Nauki o Finansach*, 1(14): 204–225.

Wolff, M. (2017). Understanding the role of centralization processes for cities – evidence from a spatial perspective of urban Europe 1990 – 2010. *Cities*, 75: 20-29.

Woods, M. & Heley, J. (2017). Conceptualisation of Rural-Urban Relations and Synergies. ROBUST Project Report, Deliverable 1.1.

Wójtowicz M., Kurek S. & Gałka J. (2014). Suburbanization in the Krakow Metropolitan Region (KMR) in the years 1995–2010. In: *Suburbanization versus peripheral sustainability of rural-urban areas fringes*, (Eds.) M. Czerny, G.H. Castillo, Nova Publishers, New York.

Zasada, I., Fertner, C., Piorr, A. & Nielsen, T.S. (2011). Peri-urbanisation and multifunctional adaptation of agriculture around Copenhagen. *Geografisk Tidsskrift-Danish Journal of Geography*, 111(1): 59-72. DOI: 10.1080/00167223.2011.10669522.

Zborowski A. & Raźniak P. (2013). Suburbanizacja rezydencjonalna w Polsce – ujęcia badawcze i ocena procesu (Residential suburbanization in Poland - research approaches and process evaluation- in Polish). *Studia Miejskie*, 9: 37-50.

Zborowski, A. (2005). Przemiany struktury społeczno-przestrzennej regionu miejskiego w okresie realnego socjalizmu i transformacji ustrojowej (na przykładzie Krakowa) (Changes in the socio-spatial structure of the urban region during the period of real socialism and systemic transformation (on the example of Krakow)- in Polish). IGiGP UJ Kraków.

Zborowski, A., Soja, M. & Łobodzińska, A. (2012). Population Trends in Polish Cities – Stagnation, Depopulation or Shrinkage? *Prace Geograficzne*, 130: 7–28.