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Spatial distribution and differences in migration patterns and revenues of gminas in the Kraków Metropolitan Area

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Abstract. Indicators describing the migration of population and revenues of local administrative units of the Kraków Metropolitan Area are presented and compared in this paper. A review of ideas on how to determine the number of Polish metropolitan statistical areas is also presented. The rank of Polish metropolitan statistical areas in world city rankings made by international publications is examined. Revenues of gminas from their own sources and total revenues of gminas are studied in the paper. Changes in revenue over time and location-dependent differences in revenue are analysed. However, the available data only allow for an examination of gminas without separating urban gminas from rural ones. Substantial differences exist in the influx of revenue, both in terms of temporal and spatial changes. In order to summarise and evaluate the relevant social and economic processes, net migration of population and total revenue of gminas in the study area have been analysed. Furthermore, a classification of areas has been developed to describe the relevant areas as being of a certain type.

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1. Introduction

Large cities are centres of economic development in today's world. The management and control functions of the world economy concentrate in metropolitan areas, which serve as key hubs of global interaction between societies so dependent on information. Metropolitan areas and multinational corporations are the primary carriers of the process of globalisation. The development of entire metropolitan areas, not just central parts of large cities, will greatly impact the development of an entire country. Some of the reasons are that research centres, cutting-edge technologies, and innovation are all concentrated in metropolitan areas.

A ranking of world cities was developed by P.J. Taylor et al. (2010). The authors identified three types of world cities: alpha, beta, gamma, and potential world cities (*sufficiency cities*). The authors considered the location of certain types of firms, particularly those involved in the following lines of business: *accountancy, advertising, management consultancy, financial services and law* in the years 2000, 2004 and 2008. An analysis of 525 cities was conducted. Subsequently, the highest category called 'alpha' was broken up into: alpha++, alpha+, alpha and alpha-. According to the classification system that was introduced, London and New York were counted among the most important cities in the world. In fact, London and New York were the only cities placed in the alpha++ category (Fig. 1). The next places in the ranking were taken by cities in the alpha+ category such as Hong Kong, Paris, Singapore, Sydney, Milan, Shanghai and Beijing. The importance of cities located in Southeast Asia such as Singapore, Beijing, Hong-Kong, and Jakarta substantially increased in the years 2000–2008. Over the same time period, cities in the United States such as Chicago and Los Angeles were losing their importance. The worst trend was noted for San Francisco, which fell down from its alpha status in 2000 to the beta+ category in 2008. An increase in the importance of metropolitan areas in developing countries (*emerging markets*) also occurred. Some cities, such as Seoul, Moscow, Bombay, Buenos Aires and Kuala Lumpur, were classified as alpha cities in 2008. It is interesting

to note that Warsaw, which used to be classified as a gamma city (Beaverstock et al., 1999), became a much more globally-connected city and in 2008 was the most important city in the alpha-category. Berlin, in spite of its dynamic development, was not present on the list of the most global cities. Out of all the cities located in former socialist countries, besides Warsaw, only Budapest and Prague were classified in the same category. At the same time, there was generally an increase in the international connectivity for cities within all alpha categories: alpha++, alpha+, alpha and alpha-. Finally, Kraków was named as a potential global city in the latest ranking.

The Polish term 'gmina' is used as a basic administrative unit for the analysis in this paper. The results are broken down into two types of administrative units: rural gminas and urban gminas (an administrative region of the 3rd order) that are municipalities. A Polish metropolitan area, or more precisely a metropolitan statistical area, may consist of several districts equivalent to gminas, while a rural gmina may include many villages and small towns. In Poland, the term 'metropolitan area' has a special meaning. The term implies a special legal status, which is not something that is normally associated with the concept of metropolitan areas. The Polish term 'metropolitan area' is used for both statistical and financial purposes, which is why many Polish cities actively pursue this special designation.

There are substantial differences of opinion in the research as far as determining the number of metropolitan areas in Poland is concerned (Table 1). Warsaw is regularly counted among global cities by international publications. Attention should also be paid to the latest publications that name Kraków as a potential global city. Considering that the progress of globalisation in cities in Central and Eastern Europe is currently quite rapid (Derudder et al., 2010), Kraków may become a metropolitan area of global significance within a decade. In addition to Warsaw and Kraków, Polish publications regularly list the following metropolitan areas: Wrocław, Poznań and the Tri-City – an urban area in northern Poland consisting of three neighbouring cities: Gdańsk, Sopot, and Gdynia. Moreover, some publications point out the well-developed metropolitan

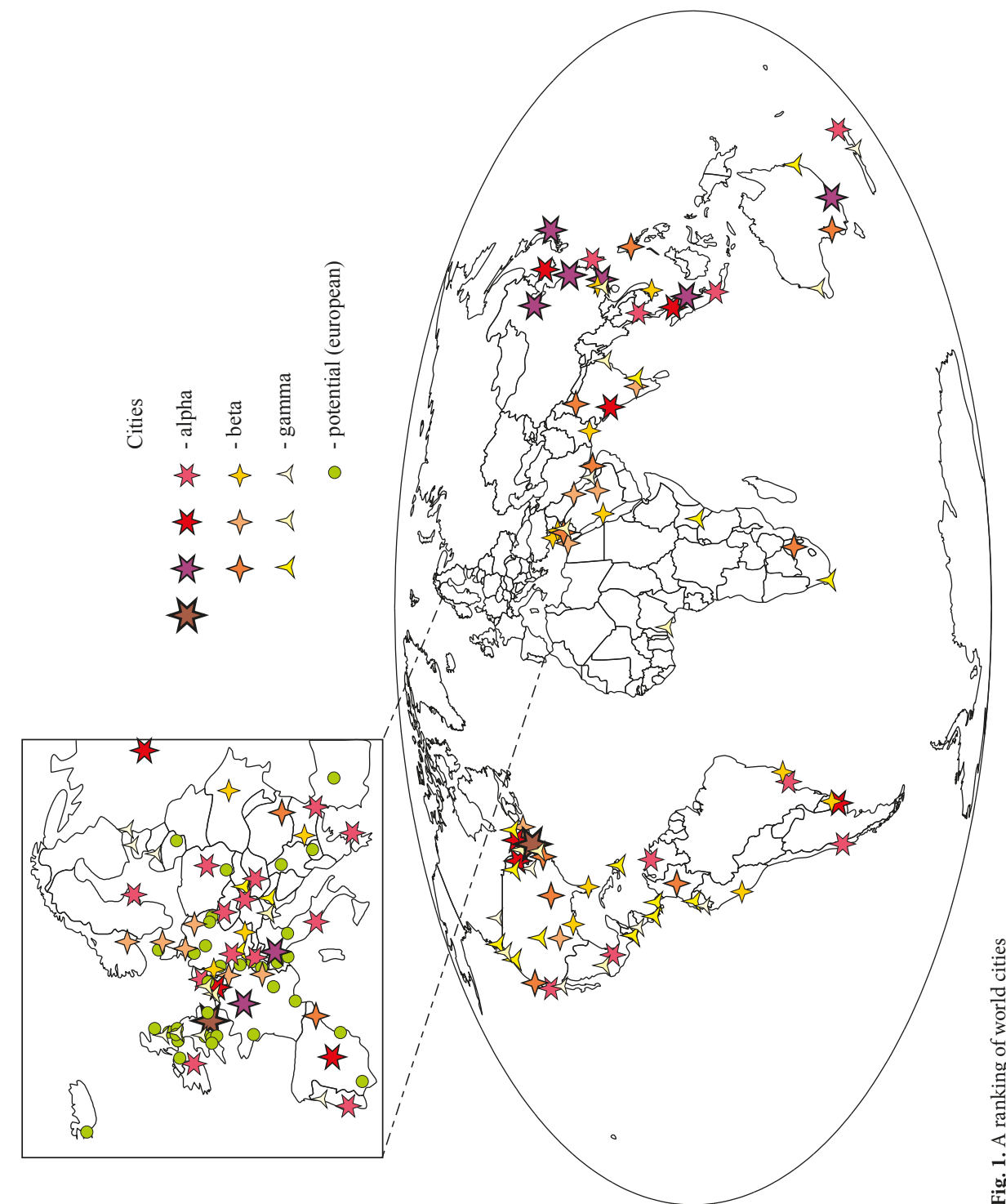


Fig. 1. A ranking of world cities

Source: Compiled by the author based on P.J. Taylor et al., 2010, GaWC Research Network

Table 1. Polish metropolitan areas according to different sources

City/ Author	Unia Metropolii Polskich (2008)	Jałowiecki (2006)	Parysek (2003)	Ilnicki (2003)	Gorzelał, Jałowiecki Smętkowski (2009)	Węclawowicz et.al. (2006)	Zborowski (2005)	Markowski, Marszał (ed.), (2006)	METREX (2000)	ESPON (2002–2006)	Beaverstock, Smith, Taylor (1999)	Taylor, Catalano, Walker (2002)	Taylor, Aranya (2008)	Taylor et. al. (2010)	Derudder et. al. (2010)
Warsaw	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Kraków	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Łódź	M	M			M	M	m ^p	M							
Wrocław	M	M	M	M	M	M	M	M	M	M					
Poznań	M	M	M	M	M	M	M	M	M	M					
Trójmiasto	M	M	M	M	M	M	M	M	M	M					
Szczecin	M					M	m ^p	m ^p	M	M					
Bydgoszcz/Toruń	M					m ^p	m ^p	m ^p							
Lublin	M					m ^p	m ^p	m ^p							
Katowice	M				M	M	m ^p	M	M	M					
Białystok	M					m ^p	m ^p	m ^p							
Rzeszów	M						m ^p	m ^p							

M – metropolitan area, m^p – potential metropolitan area

Source: compiled by the authors based on: Unia Metropolii Polskich, 2008; B. Jałowiecki, 2006; J. Parysek, 2003; D. Ilnicki 2003; G. Gorzelał, B. Jałowiecki, M. Smętkowski, 2009; G. Węclawowicz et. al., 2006; A. Zborowski, 2005; T. Markowski, T. Marszał, 2006; METREX, 2000; ESPON, 2002–2006; J.V. Beaverstock, R.G. Smith, P.J. Taylor, 1999; P.J. Taylor, G. Catalano, D.R.F. Walker, 2002; P.J. Taylor, P. Aranya, 2008; P.J. Taylor et. al., 2010; B. Derudder et. al., 2010

area-type nature of the cities of Łódź, Szczecin and Katowice (more broadly – the Katowice conurbation also known as the Upper Silesian Metropolitan Area). Well-developed metropolitan areas should be distinguished from cities that do not possess characteristics necessary to fulfill Poland's 'metropolitan designation' requirements. A 'metropolitan' city should have a population of at least 500,000 as well as significant economic and innovative potential. A city designated as such should also play an important role in international relations and trade. The related concept of the potential metropolitan area was introduced (Zborowski, 2005; Markowski, Marszał, 2006; Węclawowicz et al., 2006). Białystok, Lublin, Szczecin, the Toruń and Bydgoszcz Conurbation, and Rzeszów are the cities that are most frequently listed as potential metropolitan areas. The broadest approach is represented by the Union of Polish Metropolitan Areas. The organisation designated twelve Polish cities as metropolitan areas. In this context, it seems justified to ponder a statement made at a seminar called 'Metropolitan

Areas...' (Markowski, Marszał, 2006): 'Attention ought to be paid to the danger of progressing depreciation of the concept of the metropolitan area – the counting of cities that are functionally too weak and underdeveloped as metropolitan areas causes confusion, and in practice, makes the distinction between a large or midsize city and a metropolitan area difficult to see.'

2. Migration in the Kraków Metropolitan Area

The Kraków Metropolitan Area (KMA), as demarcated by A. Zborowski (2004), was selected for the purpose of this paper. The KMA was, by legislative decision no. 15/174/03 of the Council of the Małopolskie voivodeship of December 22, 2003, established by the Plan of Spatial Development of the Małopolskie voivodeship (The Plan of Spatial Development..., 2003). The basic administrative

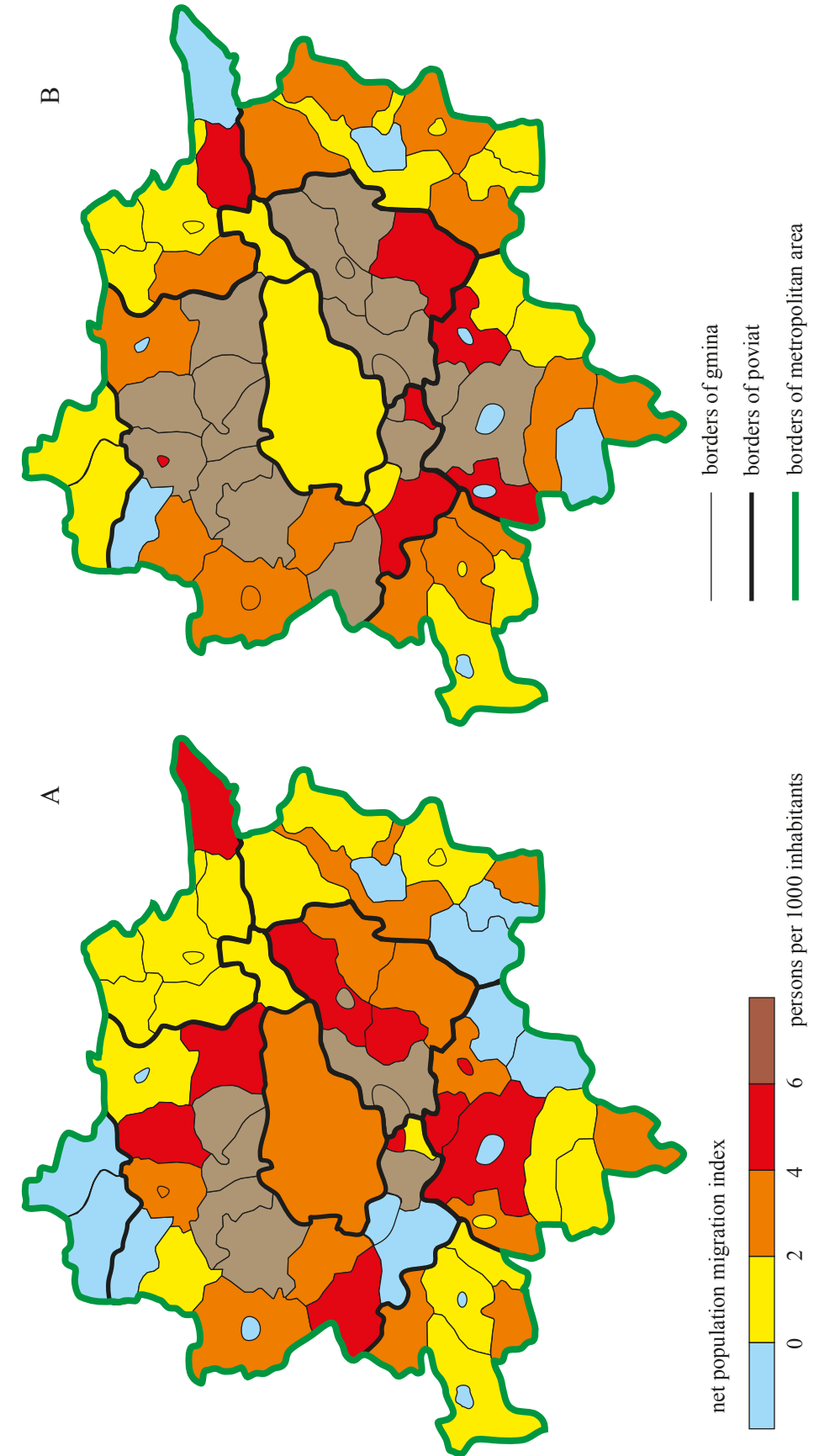


Fig. 2. Net population migration index in Kraków Metropolitan Area per 1000 inhabitants

Explanation: A – 2000/2001 year, B – 2009/2010 year

Source: Compiled by the author based on GUS data

unit used to demarcate the borders of the KMA was the gmina. A gmina covers a smaller area and has a smaller number of inhabitants than a powiat (an administrative region of the 2nd order), which is an administrative unit that encompasses several gminas and itself is a subdivision of a voivodship (an administrative region of the 1st order). The KMA was demarcated using gminas' borders, because this way the economic influence of the city proper on surrounding areas is more specifically defined than by using powiat borders.

The net population migration index shows substantial spatial differences (Fig. 2). Gminas bordering the City of Kraków and those located to the north and to the south were the most attractive areas for migrants in the years 2000–2001. The largest net migration was recorded in the gminas of Zielonki (14.7‰), Michałowice (10.9‰), the town of Niepołomice (10.3‰) and Zabierzów (9.7‰). Moreover, the remaining gminas bordering the city proper also had a net population migration index of more than 2 persons per 1,000 inhabitants. Only in Skawina the number of people migrating out of town was greater than the number of people migrating into town. Neighbourhoods on the outskirts of the Kraków Metropolitan Area were characterised by negative or small positive values of the net migration index, which may mean that they were still not very attractive to migrants during the study period. It was also observed that some smaller towns were less attractive to migrants than adjacent rural gminas. The net migration index for the towns of Myślenice, Krzeszowice, Skąpa, Sułkowice and Wadowice was negative, while for their rural gminas, it was positive. On the other hand, the towns of Dobczyce, Niepołomice, Słomniki, and Wieliczka still attracted large numbers of migrants, thus their net migration index was positive. In the years 2009–2010, the belt of gminas characterised by a high positive net migration index widened. The index measures the difference between the number of people migrating in and the number of people migrating out. For 18 gminas, the index was greater than 6 persons per 1,000 inhabitants. In the first time interval, there were only 8 gminas with a high index. This shows that the possibility

that the standard of living in the peripheral zone may be lower has no influence on the process of suburbanisation (Winiarczyk-Raźniak, 2008). There was a noticeable increase in interest on the part of migrants in areas located in the southern part of the study area: Myślenice, Sułkowice, Pcim, and Lubień. In this case, the greater distance from Kraków may be compensated for by an attractive natural landscape and a convenient location close to E7, a fast access route to Kraków and highway A4. The Kraków Metropolitan Area is becoming more and more attractive to migrants (Winiarczyk-Raźniak, Raźniak, 2012). This statement is attested to by the number of gminas with a negative net migration index per 1,000 inhabitants, which decreased from 17 in the years 2000–2001 to 9 in the years 2009–2010.

Gminas obtain revenue from a number of sources including real estate taxes, transportation taxes, personal income taxes, business taxes, estate taxes, and taxes on major gifts (Act of 13th November 2003...). The influx of new registered residents may help increase a gmina's tax base and its overall financial health. The suburbanisation of residents may also bring about the influx of new businesses if the new residents choose to register their businesses in their new gmina. Additional business taxes are also likely to help repair the gmina's budget.

The largest values of the population migration effectiveness ratio in the years 2000–2001 in the KMA were recorded for the gminas surrounding Kraków from the northwest, from the south and the east (Fig. 3). Zielonki (0.49), Michałowice (0.47) and the town of Niepołomice (0.42) ranked highest. The belt of gminas with high positive values (over 0.2) widened during the second time interval. The belt covered all of the Wieliczka powiat and substantial parts of the Kraków powiat and the Myślenice powiat (an administrative region of the 2nd order). The value of the population migration effectiveness ratio for Kraków decreased from 0.11 in the years 2000–2001 to 0.03. Meanwhile, the peripheral zone of its metropolitan area was characterised by an increase in the migration effectiveness ratio from 0.15 to 0.29.

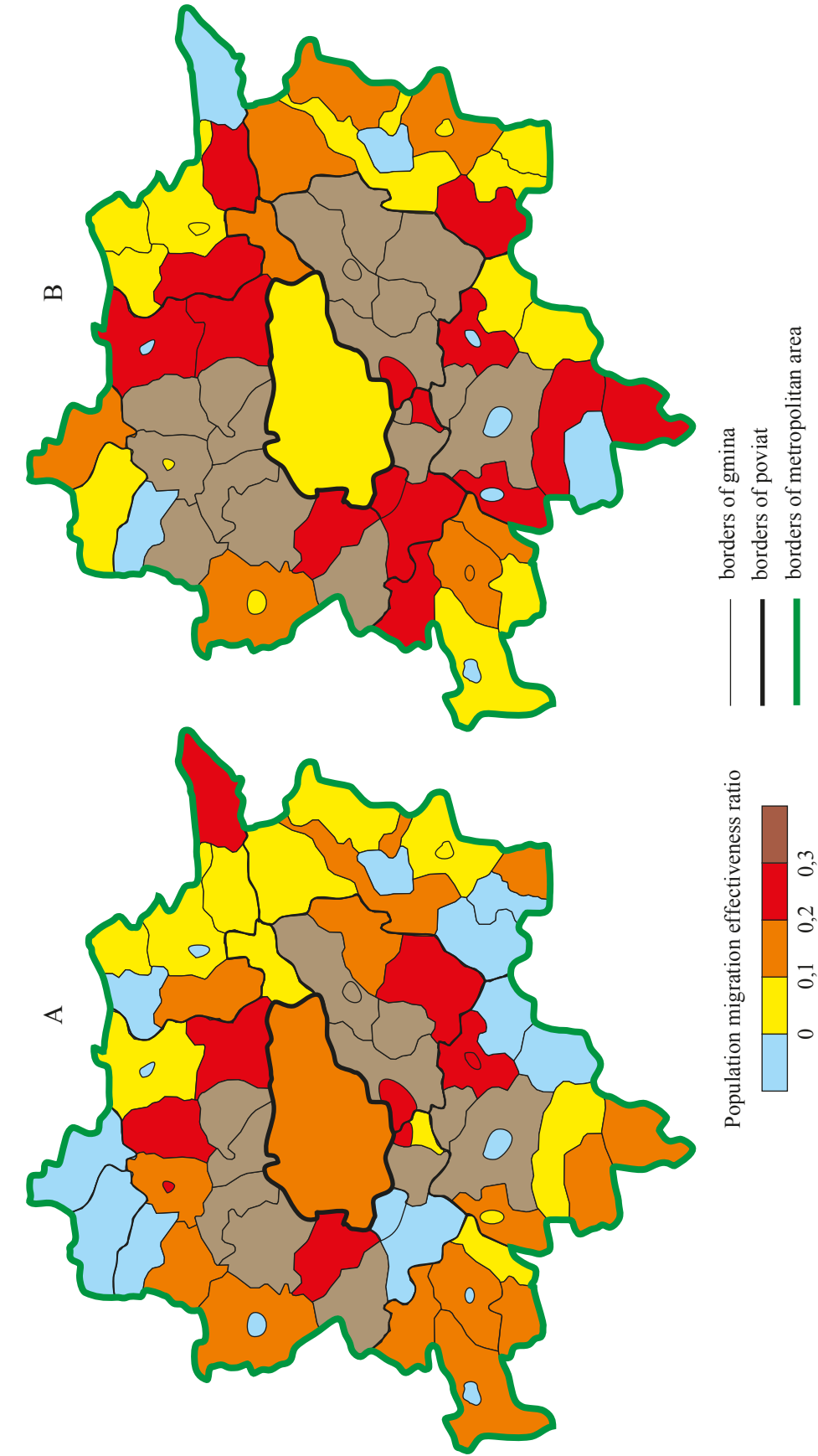


Fig. 3. Population migration effectiveness ratio in Kraków Metropolitan Area per 1000 inhabitants

Explanation: A – 2000/2001 year, B – 2009/2010 year

Source: Compiled by the author based on GUS data

3. Revenues of gminas in the Kraków Metropolitan Area

Revenues of gminas from their own sources and their total revenues for the years 2000–2001 were multiplied by an index of inflation, so that they could be compared with values calculated for the years 2009–2010. Revenues of gminas from their own sources per capita in the years 2000–2001 varied substantially depending on location (Fig. 4). The highest revenues were recorded in Kraków (1,210 zlotys per capita), Niepołomice (1,169 zlotys) and Bochnia (1,004 zlotys). The gminas neighbouring the city proper were characterised by values exceeding 475 zlotys per capita.

Gmina revenues are clearly higher in the south-western part of the metropolitan area, which is caused by the presence of towns such as Wadowice and Skawina. There is also a relationship between gmina revenue and the distance from the gmina to Kraków. Revenues of gminas located farther from the metropolitan area were lower than revenues of gminas closer to the city of Kraków. This type of dependence was noted for gminas located in the peripheral zone to the north, the east and the south of the city proper. A large increase in revenues was noted in the years 2009–2010. For the entire metropolitan area, the overall increase was 128% when compared to data for the previous time interval. Eighteen gminas were ranked in the top interval for their revenue. The highest revenues were recorded for Kraków (2,950 zlotys), Niepołomice (2,723 zlotys) and Wielka Wieś (2,020 zlotys). Most administrative units with per capita revenues over 1,000 zlotys were located in the first or second 'belt' of gminas surrounding the city proper. This observation may just confirm the fact that the influence of Kraków on its peripheral areas is becoming stronger. Then again, administrative units located on the outskirts of the Kraków Metropolitan Area generally were ranked in the second and third value intervals for their revenues. The rate of revenue growth was quite different for the two time intervals analysed.

Revenues of gminas from their own sources grew at the slowest rate in gminas located on the

edges of the metropolitan area. Revenue growth rates exceeding 130% were recorded for the following administrative units: Dobczyce, Niepołomice, Igołomia-Wawrzeńczyce, Kraków, Sułszowa, Wielka Wieś, and Koszyce. A clear dependence of the revenue growth rate on the distance from the metropolitan area was not observed. One may think that sensible governance and appropriate pro-development policies introduced by local authorities may be of importance, and that they may have affected the amount of revenue in particular gminas in a positive way. Gminas located far away from Kraków (Raciechowice, Trzciana, Rzezawa, Łapanów) may be examples of this and are characterised by revenue growth rates exceeding 2,650 zlotys per capita. They attracted plenty of investment while offering large pieces of land for this very purpose (Gorczyca, 2008). The saturation of Kraków with investments may have indirectly affected the amount of revenue of gminas on the outskirts of the metropolitan area. Increases in real estate prices and leasing costs due to greater demand related to investments caused that land located outside of the city proper became more attractive. Yet, the main factor helping in establishing new firms, especially those with a share of foreign capital, in the gminas in the outermost belt of the metropolitan area is the close proximity of Kraków (Raźniak, 2009).

It was also observed that Kraków dominates the metropolitan area in terms of the amount of total revenue of gminas per capita in the years 2000–2001 (Fig. 5). The total revenue of the City of Kraków was 2,430 zlotys per capita. At the same time, total revenues of most surrounding gminas fell within the first or second interval of total revenue, which means they did not exceed 1,850 zlotys per capita. In the second time interval, an increase in total revenue was noted for all the studied gminas. It appears that the most affluent administrative unit was Kraków (4,443 zlotys per capita), followed by Niepołomice (4,126 zlotys) and Dobczyce (3,531 zlotys). Twenty gminas were placed in the top value interval in terms of their total revenue in the years 2009–2010, while for the preceding time period, the total revenue of the gminas of the Kraków Metropolitan Area did not exceed the threshold of 2,650 zlotys per capita. All the gminas

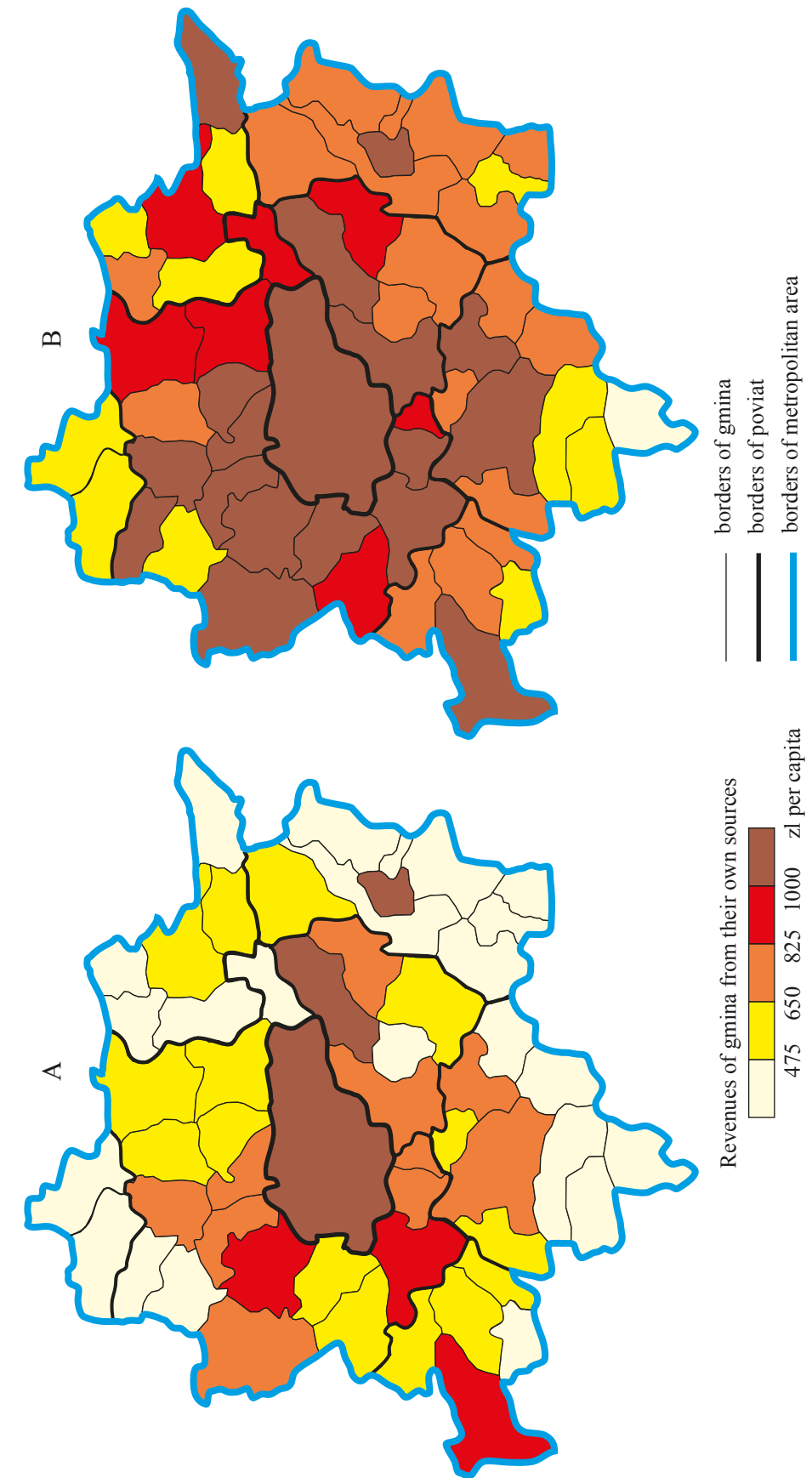


Fig. 4. Revenues of gmina from their own sources per capita in Kraków Metropolitan Area
Explanation: A – 2000/2001 year; B – 2009/2010 year
Source: Compiled by the author based on GUS data

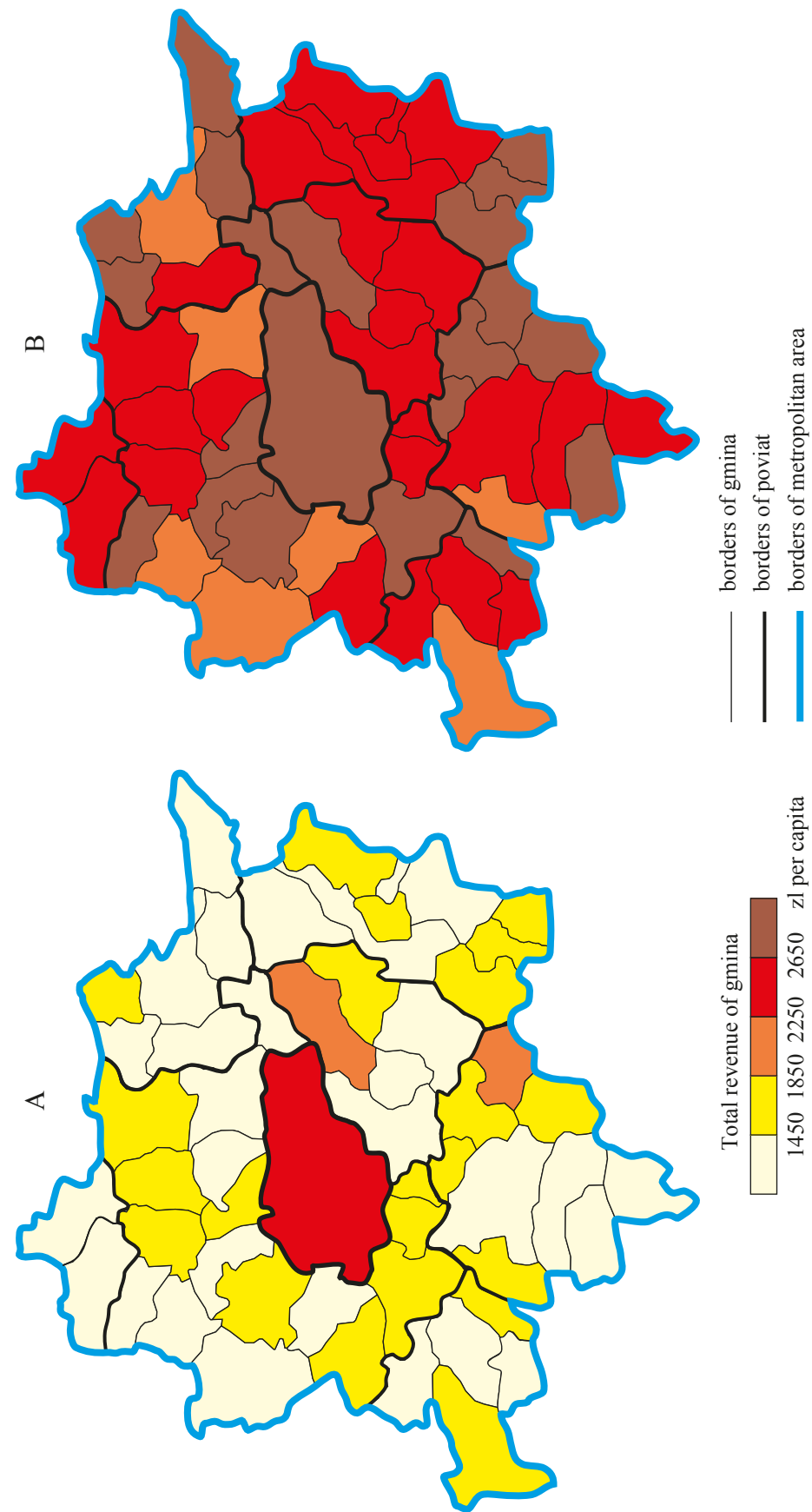


Fig. 5. Total revenue of gmina per capita in Kraków Metropolitan Area

Explanation: A – 2000/2001 year; B – 2009/2010 year

Source: Compiled by the author based on GUS data

were characterised by total revenues exceeding 2,000 zlotys per capita. The least affluent gmina was Kocmyrzów-Luborzycza, where the total revenue per capita was only 2,096 zlotys.

4. Types of gminas based on the net population migration index and total revenue per capita in the Kraków Metropolitan Area

Emerging job markets in new suburban areas prompt the migration of individuals to such suburban areas (Merriman et al., 1995; Champion, 1994). Major investments made by foreign companies in suburban areas near Kraków (Domański et al., 2009) may also attract new residents from the city as well as other parts of the country. Once again, the influx of new residents will tend to benefit local governments in suburban gminas.

A classification system for administrative units was developed in order to summarise the findings of this research. The system establishes different types of gminas based on characteristics such as the net population migration index and the total revenue of a gmina (Fig. 6). This resulted in the identification of nine types: type 1 – characterised by a negative net migration index and total revenue below 1,500 zlotys per capita; type 2 – characterised by a net population migration index in the interval 0–3‰ and total revenue below 1,500 zlotys per capita; type 3 – characterised by a net population migration index over 3‰ and total revenue below 1,500 zlotys per capita; type 4 – characterised by a negative net population migration index and total revenue in the interval 1,500 – 2,500 zlotys per capita; type 5 – characterised by a net population migration index in the interval 0–3‰ and total revenue of 1,500 – 2,500 zlotys per capita; type 6 – characterised by a net population migration index over 3‰ and total revenue in the interval 1,500 – 2,500 zlotys per capita; type 7 – characterised by a negative net population migration index and total revenue over 2,500 zlotys per capita; type 8 – characterised by a net population migration index in the interval 0–3‰ and total revenue over 2,500 zlotys per capita; and type 9 – characterised by a net

population migration index exceeding 3‰ and total revenue over 2,500 zlotys per capita. Type 9 is generally considered the most dynamic. Types 8, 6, 5 and 3 are characterised by rather high levels of social and economic development, whereas types 1, 2, 4 and 7 are considered the weakest among the specified. In the years 2000–2001, no gmina was classified as type 7, 8 or 9, whereas the weakest types such as 1, 2 and 4 were most prevalent. The gminas bordering Kraków and located to the north and south of the city were judged to be types 3 and 6, which means that the social and economic development of these areas represents an average level.

A sharp increase in the component indicators the described typology is based on occurred in the second time period. Most gminas in the Kraków Metropolitan Area, in the years 2009–2010, were classified as dynamic types 6, 8 and 9, which are characterised by a positive net population migration index and large total gmina revenues. The gminas in the outermost belt of the Kraków Metropolitan Area are characterised by index values corresponding to a social and economic development level that is not very high (types 4, 5 and 7). Already there appears to be a general correlation between gmina revenue and net migration. Gminas experiencing high positive rates of net migration are also recording increases in tax revenue.

5. Conclusions

The paper analyses selected social and economic trends that may affect the economic and social development of the Kraków Metropolitan Area. Kraków is gaining ground as an internationally-linked city and may become Poland's second city with a global reach – after Warsaw. More and more companies in the financial, advertising, consulting and legal sector are opening offices in Kraków. Poland lacks an effective legal framework for defining what a 'metropolitan' city should be and how many cities in Poland may be designated as such. Hence, different researchers list different numbers of metropolitan cities in Poland. There are five to seven metropolitan cities in Poland and Kraków

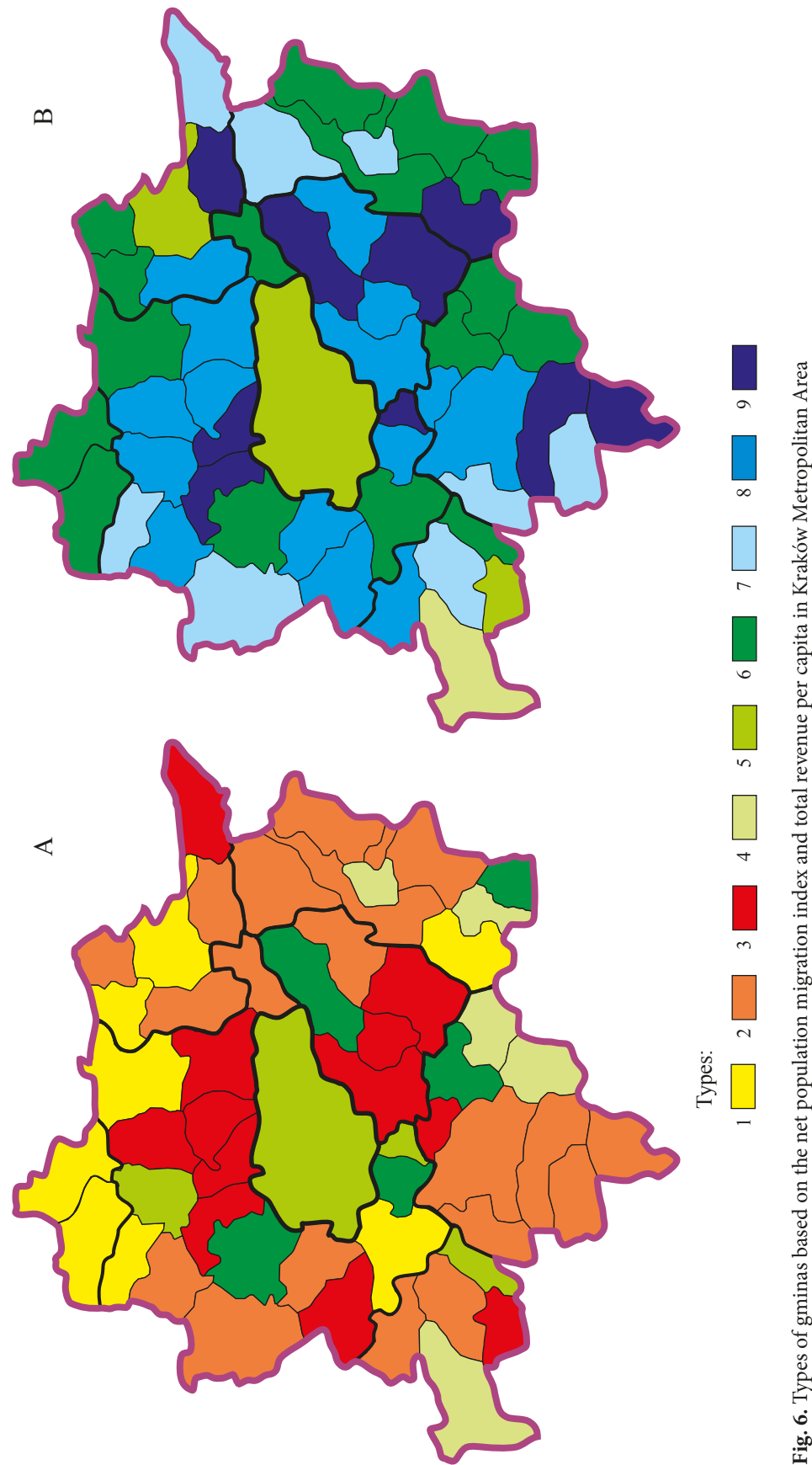


Fig. 6. Types of gminas based on the net population migration index and total revenue per capita in Kraków Metropolitan Area
 Explanation: A – 2000/2001 year; B – 2009/2010 year; 1 – negative net migration index, total revenue below 1,500 zł per capita; 2 – net population migration index 0–3‰, total revenue below 1,500 zł per capita; 3 – net population migration index over 3‰, total revenue below 1,500 zł per capita; 4 – negative net population migration index, total revenue 1,500–2,500 zł per capita; 5 – net population migration index 0–3‰, total revenue 1,500–2,500 zł per capita; 6 – net population migration index over 3‰, total revenue 1,500–2,500 zł per capita; 7 – negative net population migration index, total revenue over 2,500 zł per capita; 8 – net population migration index 0–3‰, total revenue over 2,500 zł per capita; 9 – net population migration index over 3‰, total revenue over 2,500 zł per capita

Source: Compiled by the author based on GUS data

is always named as one by Polish researchers. International linkages have put the city on the global map and this is certain to cement its status as a metropolitan city. The city of Kraków is also strongly linked to its emerging suburbs. The city is ringed by gminas that continue to attract new residents as well as by a second ring of gminas that also attract new residents. In addition to distance, the presence of infrastructure also plays a role in attracting new residents to suburban gminas that may not be close to central Kraków but are close to major highway interchanges (Zabierzów, Wielka Wieś) and major highways in general (Lubień, Myślenice – National Highway E7). Moreover, gminas located in the more distant suburbs are becoming more affluent and are beginning to approach the level of affluence found in gminas directly adjacent to Kraków. One reason why the rate of economic growth is so high in peripheral gminas is their relatively low level of affluence in past decades. On the one hand, this may be the result of convenient location and the growth policies of local governments. On the other hand, personal and business taxes may be responsible. Research has shown that positive net migration results in positive net revenue for a growing number of Kraków area gminas. This is a general indicator of the high rate of growth in the Kraków Metropolitan Area in the years 2000–2010.

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