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1. DEMOGRAPHIC SITUATION IN POLAND AFTER 1990

1.1. Introduction

The period of political and socio-economic transformation in Poland is related to dynamic demographic changes. They are reflected in the population's spatial structure. Its development and demographic structure are influenced by both internal and external factors, including globalisation processes. In this study, the authors focus on processes and demographic spatial structures. The chapter consists of two parts. The first covers development and reproduction as well as migrations of the population and its demographic restructuring. In the second, the authors present an analysis of spatial diversification of major demographic features and spatial demographic typology. Population changes were studied on the basis of data for individual years between 1990 and 2012, while the population's spatial structure is presented in a division according to poviats (379) as of 2012.

The study uses published and unpublished demographic information by the Central Statistical Office and relates to analyses and

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diagnoses of demographic situation examined by various researchers, e.g. B. Urłanis (1966), L. Kosiński (1967), A. Jagielski (1974), A. Maryański (1977), M. Okólski (1990), H. Jones (1993), J. Dzieciuchowicz (1995a, 1998, 2002b), J.I. Clarke (1998), T. Kaczmarek et al. (1998), D. Jędrzejczyk (2001), A. Gawryszewski (2005), S. Kurek (2008), A. Janiszewska (2013b), J. Dzieciuchowicz and A. Janiszewska (2013).

This study relates to the rich output of the Łódź geographical centre in researching spatial processes and demographic and social structures of the population. It includes the complex area viewed both within the global and regional scale as well as locally. The scope of research contains demographic and social problems of the modern world (Dzieciuchowicz 2010a, 2011, 2013), the Second Demographic Transition in Europe and its implications (Janiszewska 2013a), spatial matrimonial and procreative behaviour (Janiszewska 2013) as well as the influence of unemployment on definitive migrations in Poland (Dzieciuchowicz 2004b), spatial processes and structures of the Łódź region population (Dzieciuchowicz 1998, 2002a, b, 2003), including the processes of depopulation of the countryside within the area of the former Piotrków Province (Michalski 1990), spatial redistribution of the population and its demographic and socio-economic determiners and consequences in the Łódź agglomeration (Dzieciuchowicz 1989, 1995b, d, Jakóbczyk-Gryszkiewicz and Ostrowski 1982, Straszewicz 1963, 1964). Various studies have been devoted to the development and the evolution of the spatial structure of the Łódź population according to demographic and social characteristics (Dzieciuchowicz 1983a, b, 1988, 2009b, c, d, 2010a, b, c, Jakóbczyk-Gryszkiewicz 1997, 2009, Janiszewska 2009), including the demographic problems of its centre (Dzieciuchowicz 1984) and vertical stratification of demographic and social characteristics of the population of the Śródmiejska Dzielnica Mieszkaniowa (Central Residential District) (Dzieciuchowicz 1986, 1991b). Researchers have also turned their attention to the process of demographic reproduction of the Łódź population, particularly the spatial and demographic and social selection of marriages (Janiszewska 2007). Several studies were de-

voted to spatial variability and changing conditions – definitive and alternating – of the migrations of the Łódź population and the region and the Bełchatów Industrial District (Dzieciuchowicz 1979, 1981, 1995a, d, 1997, Michalski 1980, Michalski and Marczyńska-Witczak 1983) as well as to the role of information in migration processes in the light of cognitive theory of migration (Dzieciuchowicz 1995c, 2002b) and the economic and socio-economic conditions behind migration in the context of the theory of human capital and geobiography (Dzieciuchowicz 2009a, Kaczmarek 2004). Other studies were related to spatial and demographic and social evolution and territorial origins and naturalisation of the Polish emigration in France (Dzieciuchowicz 1990, 1999a, 2000, Marszał 2001, Straszewicz 1985). Additionally, researchers have also studied the diversity of spatial economic activity of the population of Łódź (Dzieciuchowicz 2006a, b) and spatial variability of social structures (Dzieciuchowicz 2009b, c, d, 2010b, c, d, Rembowska and Ślipek 2002), including voting attitudes of the Łódź population during local-government elections and, in detail, the role of religious denominations in shaping the urban space of Łódź (Dzieciuchowicz et al. 2004, 2005) and the conceptualisation of the notion of religious space of a city and its empirical verification (Klima 2011).

1.2. Demographic processes

1.2.1. Population development. Demographic forecast

Population development. In 2012, Polish population reached 38.5 million (31st December). Starting from 1990 (38.1 million), it did not change significantly. Nonetheless, demographic development recorded a small upward tendency at that time. It was a result of different tendencies specific for the development of urban and rural populations. Urban population featured a slight downward tendency (from 23.5 million in 1990 to 23.4 million in 2012) while rural population was significantly upward (from 14.5 million in 1990 to 15.2 million in 2012). These tendencies are reflected in dynamics

indexes (1990 = 100) calculated for individual years within the analysed period. Identified disproportion in the development of the city-countryside structure resulted in a small drop in the share of urban population in the country's general population (from 61.8% in 1990 to 60.7% in 2012). One must remember that the process of de-urbanisation was accompanied by growing suburbanisation. It need also be noted that countrywide, in 1990–2012, an increase of population accounted for a small increase population density as well (from 118 to 119.5 people per 1 km^2).

Demographic forecast. Demographic forecast for Poland by 2035, which was developed by GUS, indicates unfavourable demographic perspective for the country which are reflected mainly in a systematic decrease of the population. Between 2011 and 2035, it will decrease from 38.5 million to 35.99 million, i.e. by 2.546 million (by 6.6%). This data confirm large-scale depopulation. It is significant that a major drop in population will occur already in 2025 when it will decrease by 1.1 million (2.9%). Depopulation will later accelerate.

The forecast population changes will be accompanied by important transformations of sex and age structures. Feminisation ratio will increase in 2011–2015 (from 1.066 to 1.074 females/males) and decrease slightly in the following years. Major changes will occur within age structure. The share of children and the youth (aged 0–19) will decrease significantly (from 21.1% in 2011 to 17.8% in 2035). The share of adults (aged 20–59) will record an even higher drop (from 58.7% to 52.2%). In terms of absolute figures, this group's population will decrease by 3.8 million which shows the scale of potential threats to employment market resulting from insufficient workforce. Finally, the most dynamic increase will be recorded among people aged 60 and more (from 20.2% to 30%). The significance of demographic ageing is further emphasised by the absolute increase of the population reaching 3 million people. This will in turn increase age dependency among adult population. As a result of an ageing society, Poland will have less and less working people which will hamper economic growth.

1.2.2. Demographic reproduction

Formation and breakdown of marriages. In 2012, nearly 204 000 marriages were contracted in Poland, i.e. over 50 000 less than in 1990. The analysed period of demographic changes in our country did not, however, display a permanent downward tendency of the frequency of entering into marriage. Between 1990 and 2012, one might define sub-periods of both decreases and increases of the number of new marriages. Final years, i.e. 2010–2012, indicate a return of a drop in Polish affinity to entering into marriage. A measure which illustrates this is the marriage contracting ratio which decreased from 6.7‰ in 1990 to 5.3‰ in 2012. There is also a specific difference in terms of the ratio between cities and the countryside. All until the 1980s, the frequency of entering into marriage in cities was higher than in rural areas and value differences which initially would reach 3‰ gradually decreased to 0.5 – 1‰. Since 1989, the tendency has been reversed and the frequency is higher in the countryside, though ratio differences are small (Figure 1.1).

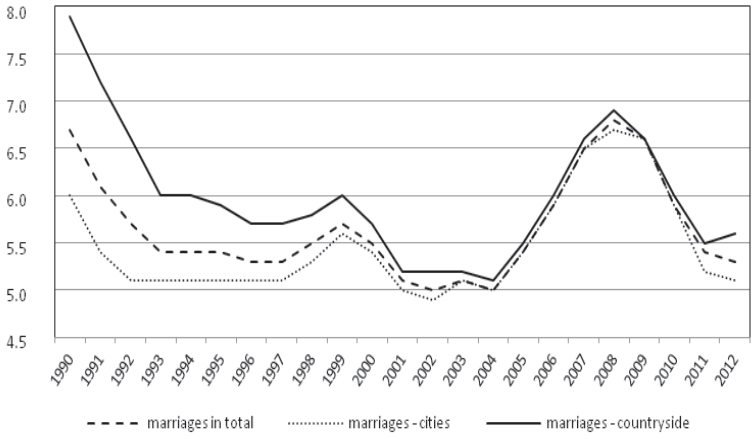

Figure 1.1. Marriages per 1000 inhabitants in Poland in 1990–2012

Source: own elaboration based on GUS data

In Poland, the possibility of contracting marriages apart from civil also religious marriages with the legal effect in civil law which are commonly called concordat marriages was introduced on the 15th November 1998. In 2012, 64% such new marriages were contracted, the rest being civil unions; in cities, this percentage was only 59%. Religious unions were more "popular" in rural areas where they constituted over 71% legalised unions. The proportions between the number of new religious and civil unions after 1999 have been changing in favour of religious unions, e.g. in 2002, they constituted 73% of all new unions. Gradually however, their share would decrease and now it remains at a level similar to that in 1999.

Another relevant feature of contracted marriages is the age of newlyweds. Significant changes in the age structure of newlyweds which have occurred in many developed countries in the world, including Poland, were described by the theory of the Second Demographic Transition (van de Kaa 1994, 1996, 2001, Lesthaeghe 1995, Lesthaeghe and Surkyn 2002, Frejka 2008, Kotowska et al. 2008). Starting from the 1990s, young people's aspirations and preferences who were becoming adults have changed due to socio-economic changes. A reflection of these transformations is, for instance, entering into marriage at a later age; in 2011, nearly 45% of men and over 39% of women entered into marriage at the age of 25–29. The age median of newlyweds was 28.5 for men and 26.7 for women (in 1990 respectively 24.6 and 22.7). Urban residents married at a slightly older age (in 1990: 24.8 men and 23.1 women; in 2011 respectively 29.1 and 27.4) than rural inhabitants (in 1990: 24.5 men and 22.3 women; in 2011 respectively 27.7 and 26.5).

Breakdown of marriage occurs as a result of the death of a spouse or divorce or separation.[1] The number of adjudicated di-

[1] The institution of separation was introduced to Polish legislature through an Act dated 21st May 1999 (J L 1999, 52, Item 532). It repeals joint property of spouses without the right to enter into new marriage. Art. 61 (2) thereof reads: "However, regardless of total breakdown of cohabitation, the separation statement is not possible if as a result of it, the well-being of minor children of spouses would be threatened or if for other reasons separation statement would violate the principles of social coexistence".

vorces in early 1990s exceeded 42 000 and was lower by 22 000 than in 2012. Similarly to the number of new marriages, divorce tendencies changed throughout the analysed period. At the beginning of the 21st century, the number of adjudicated divorces increased from 45 300 (2001) to 71 900 (2006) only to decrease to 64 400 in 2012. The national divorce ratio in 2012 reached 1.7 per 1000 people, 2.1 for cities and 1 for the countryside.

In Polish legislature, apart from divorces, there exists the institution of separation which repeals joint property of spouses and prohibits spouses from entering into new marriages. The number of separations legally granted in Poland grew dynamically, in 2000, 1340 of separations were granted and in 2005 as much as 11 600 (an increase by more than 800%). Since 2006, the number of adjudicated separations has continued to decrease reaching only 2843 cases in 2011. In 2011, separation ratio (number of separations per 100 000 people) reached 7.4 and, as in the case of divorces, the separation intensity is higher in cities than in the countryside (8.8 cities, 5.1 the countryside). Even though the absolute number of adjudicated separations decreased, the separation ratio per 1000 new (contracted) marriages increased to 13.8 when compared to the previous year (2010), reaching: in cities 16.8 and 9.3 in the countryside.

Fertility. Since the 1990s, there has been a systematic decrease of the number of births in Poland (it already started in the 1980s). Regardless of the changes introduced in the 1980s to the labour law which enabled women to, e.g. utilise child care leave, the number of births dropped from 547 700 (14.3‰) in 1990 to 351 100 (9.2‰) in 2003 (Figure 1.2). Birth rates decreased even though late 1990s was a time when the generation of 1976–1983 baby boom reached reproductive age. A decrease of the number of births has been recorded in cities since 2002 and since 2004 in the countryside. A change of fertility patterns occurred as a result of socio-political transformations of early 1990s, which suppressed the effects of the second wave of the post-World War II baby boom and instead of the

expected increase in the number of births in 1996–2003, fertility would decrease (Gawryszewski 2005). Then, in 2004–2009, the number of births nationwide would increase on average by 2% annually reaching 417 600 in 2009. In recent years, another drop in the number of births was recorded, reaching 386 300 in 2012 (10‰). A result of the change of the fertility pattern in our country are, e.g. the values of theoretical total fertility rates. Researchers have been observing a continued decrease of TFR within the analysed period from 1.99 child per woman in 1990 to 1.30 in 2012.

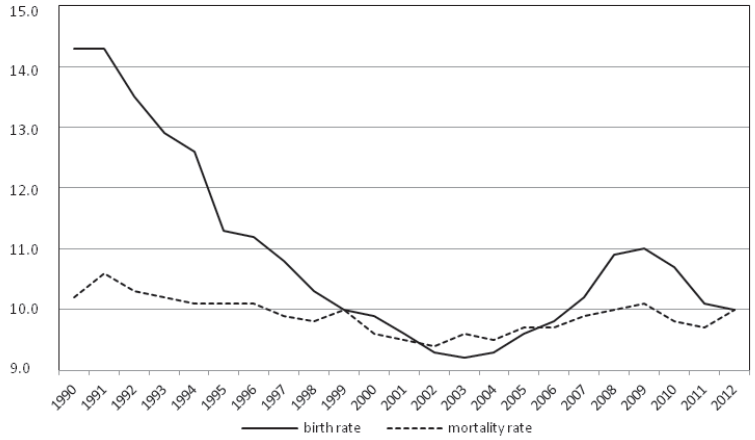

Figure 1.2. Births and deaths per 1000 inhabitants in Poland in 1990–2012

Source: own elaboration based on GUS data

Fertility changes in Poland also apply to the order of child births by a given mother. When considering births by the order, one will notice that each year births originate from different groups of women. Those groups always consist of women giving births on a given year. In 1990, first and second births constituted nearly 72% of all births in the country while today (2011), it is already 85%. The increase was largely influenced by first births which have

become more common both in cities and in the countryside. At the same time, the share of consecutive births decreased, especially of a higher order. In all analysed years (1990–2011), the share of third and consecutive births was higher among women in the countryside than in cities.

A characteristic feature of contemporary demographic behaviours in Poland is the continued increase of the share of illegitimate births in the total number of births. Until recently, reproductive behaviours were strictly connected with matrimonial behaviours. The relationship between the number of new marriages and the number of birth, both potential and actual, was high. The changes related to the Second Demographic Transition also influenced reproductive behaviours by increasing the share of non-marital births, including in civil partnerships and by single mothers. In 1990, the share of illegitimate births was 6.2% while currently, nearly 20% of all newborns are born out of wedlock.

Mortality. Even at the beginning of the 21st century, the number of deaths in Poland was decreasing. That was the case until 2002 when 359 500 died in Poland. Since then until 2009, the number would rise but in 2010, there were fewer deaths in Poland than in the previous year. There were 378 000 such cases, i.e. by over 5000 less than in 2009. That was the case regardless of the fact that the population of elderly people continued to grow. The number of people aged 60+ increased in 2002–2009 from 6.486 million to 7.283 million and in 2010, the number reached 7.397 million. Thus, the share of the age group in the total Polish population increased from 17% to 19.4%. Since the socio-economic transformation, we have been observing a favourable change of mortality (however, in 2012, the number deaths reached 384 700). The basic measure of the intensity of the process, i.e. mortality rate, decreased in 1990–2012 by 0.2‰ (Figure 1.2). As a result of a drop in mortality rate in 1990–2012 the life expectancy of the inhabitants of Poland increased considerably. The life expectancy of a male new-born extended by more than 6 years from 66.2 to 72.7 years and from 75.2 to 81 years for females, i.e. by almost 6 years.

Within the discussed period of 1990–2012, the drop in infant mortality was the highest. Infant mortality rate per 1000 live births decreased from 19.3‰ in 1990 to 4.6‰ in 2012. The situation is a result of continued care for the young which is manifested in the healthcare specialists' diligence in providing a good level of care for both pregnant women and children as well as the growing awareness of parents in terms of their children's upbringing.

Both in Poland and in the world, the most common causes of death include: cardiovascular diseases, cancer and external factors. The share of deaths caused by diseases from those groups in 2011 reached 77.1%, i.e. it changed slightly when compared to previous years. Within the period of 1990–2011, the significance of cardiovascular diseases and external factors as causes of death decreased gradually with time but the share of deaths caused by cancer increased.

Natural increase. Demographic increase or loss is influenced by both, the number of births and deaths. In 2012, the difference between live births and deaths, i.e. natural increase was positive reaching ca. 1500. Population growth rate (calculated per 1000 people) was close to nil (negative in cities: –0.4‰, positive in the countryside: +0.7‰). In the 1990s, the size of natural increase decreased along the decrease of the number of births. In 2002–2005, a natural loss, the highest since 2003, was recorded when the number of deaths was higher than the number of births by over 14 000. Since 2006, population growth has been positive once again but significantly smaller in the last two years.

1.2.3. Migration movements

Internal migration. The main component of spatial mobility of the Polish population is internal migration. Their significance is illustrated by, e.g. migration turnover in which – with some underestimation of internal migration – in 1990–2012, 872 300 people participated on average. It intensity displayed a general downward

tendency (from 27.9‰ to 20.5‰), caused by, e.g. deteriorating economic situation. It must be stated that the share of the turnover in the city in the total migration turnover (56.3% on average) was higher than that in the countryside, which was a result of excess size of urban population. With time, the share increased irregularly.

The volume of migration of urban population within the analysed period recorded a general drop (490 000 on average). Gradually, the migration net would also decrease (2800 on average), however, it was still positive until the end of the 1990s only to record negative values afterwards. Nonetheless, the migration turnover ratio displayed a general upward tendency (56.3% on average) while the migration net ratio a downward tendency (0.11‰ on average). Internal migration in the countryside offered different directions of change. The volume of those migration would decrease (381 900 on average) whereas their balance would increase, initially recording negative values and reaching positive ones since the end of the 1990s (2800 on average). This was accompanied by the emergence of a downward tendency in the migration turnover ratio (43.7‰ on average) and upward tendency in the migration net ratio (0.21‰ on average).

Foreign migration. The volume of permanent foreign migration in 1990–2012 – with underestimation difficult to define – was several times smaller than internal migration displaying a general upward tendency. The average annual size of external migration would only reach 33 100. Migration turnover ratio, just as turnover itself, had a distinctive upward tendency (0.86‰ on average). At the same time, the irregularly changing balance of foreign migration remained negative (14 100 on average) slowly resulting in a decrease of the negative migration net ratio (0.37‰ on average). It is difficult to evaluate the tendency positively as it was so weak.

The total size of foreign migration was largely dominated by movement of urban population (78.2% on average). In this case, intensity of migration net displayed an upward tendency (0.5‰ on average), while, in the case of the countryside, the tendency was downward (0.17‰ on average).

The directions of foreign migration in 1990–2011 were changing dynamically. While emigration at that period increased only slightly (from 18 400 to 19 900), immigration boomed (from 2600 to 15 500). In 1990, 75% of the total emigration from Poland targeted European countries, mainly Germany (62.8%). Countries of North and Central America, particularly the United States and Canada were also a popular destination. By 2011, emigration to European countries increased considerably (86.4%), however, emigration to Germany decreased (39.2%) while emigration to Great Britain increased (22.3%). The significance of North and Central America also decreased. Throughout the analysed period, Asian, African and South American countries and Australia and Oceania were the least popular emigrant destinations. There has been a significant outflow of the Polish population abroad particularly from the eastern part of the country and from Opolskie region.

In 1990–2011, the immigration boom to Poland was accompanied by a radical change of source countries. The role of European countries grew significantly (from 64.7% to 81.3%), mainly Great Britain (from 3.7% to 28.2%) while the share of immigration from Germany dropped (from 23.8% to 17.1%). Immigration from North and Central America also decreased considerably. Immigrants from other non-European countries were scarce throughout the analysed period. It must be stated that among emigrants, the majority were young people (aged 25–34), mainly among women and children (aged 0–9) in the case of immigrant and to smaller extent young adults, this time men rather than women. This data indicates that a portion of immigration is return migrations. The gap between the standard of living in Poland and EU countries spurs emigration of young Poles.

1.2.4. Demographic restructuring

Sex structure. The sex structure of the population is shaped by, on the one hand, by natural biological processes, such as stable predominance of male to female new-borns (105–107 males are born in Poland per every 100 females) and higher mortality of men than

of women and, on the other hand, migration movements resulting from socio-economic processes.

Within the entire analysed period, there was a numerical predominance of women over men, reaching in 1990 nearly 970 000 people. The female ratio, i.e. the number of women per 100 men, was 105.2. With time, the predominance of the size of female population increased slowly. In 2009, it reached 1 309 000 people which meant an increase of the female ratio to 107.1. Data from the previous three years indicates that the process slowed down slightly. By the end of 2012, female population exceeded the male population by 1 235 000 people and the female ratio when compared to the figures in 2009 decreased slightly reaching 106.6 females/males. Male/female numerical relations in cities and in the countryside differed considerably. Cities have recorded a predominance of women. In 1990, for every 100 males there would be 108.3 women there while in 2012, the value reached 110.8. The above-mentioned data indicate unfavourable numerical relations between men and women in urban areas. The countryside displays a different female ratio. In 1990, for every 100 males there would be 100.4 women there; it rose in the following years to reach 101.0 in 2010. In recent years a slight drop was recorded; by the end of 2012, the female ratio in the countryside was 100.6 females/males. Evidently, in the case of the rural population, one can talk about an almost perfect numerical population relation per sex. A large predominance of women in cities and near equivalent numbers of both sexes in the countryside are a result of outflow of women, particularly young women, from the countryside to cities in previous years.

Age structure. Changes to the numbers and structure of the population in terms of age are formed by three factors: the number of births, deaths and the size and structure of migrants. Those factors caused profound transformations of the population structure according to economic age groups in Poland in 1990–2012. They are reflected in a considerable drop in the number of children and the youth and a high increase of older population. The group of people aged 0–17 decreased in 1990–2012 from 11.043 million to 7.243 million, i.e. by 3.800 million people; thus, within 23 years, it

decreased by 34.4%. This was a result of continued decrease of the number of births which occurred within the discussed period. The drop in the number of children and the youth radically changed their relative share in the total population size. It decreased from 29% in 1990 to 18.3% in 2012. The next much larger age group of 18–59/64, which is referred to as the working age population, recorded an increase by 2.460 million people between 1990 and 2012, i.e. by 11.1%. The share of the working age population in 2012 was 63.9% of the total population; when compared to the figures in 1990, it increased by 5.7 percentage points. The third population group identified within the economic division, namely people aged 60/65+, displays the highest dynamics. Within the period of 1988–2002, its size increased by 1.572 million people, i.e. 32.2%. As a result, the share of people aged 60/65+ in the total population of the country: by the end of 1990 reached 12.8% while in 2012, it was 17.8%.

1.3. Spatial distribution of population

1.3.1. Distribution of population and its density

Spatial distribution of the Polish population according to poviats, formed as a result of various demographic, social, economic, political and natural factors, is extremely irregular (Figure 1.3). This is mainly visible through the variation ratio of poviat populations (V = 115%),[2] which in turn emphasises the irregularity of the discussed administrative division. It also features a high rightward asymmetry (A = 8.0) which is related to dominance of poviats which populations are smaller than country average (101 671 people). They constitute 61% (262) of all poviats (379). At the same time, high spatial concentration of the population is visible when one considers that 39% of poviats with higher than average populations gather 57% of the total Polish population.

[2] In this study, symbols V, A, K and r correspond to respective coefficients: of variation, of asymmetry, of kurtosis and of linear correlation.

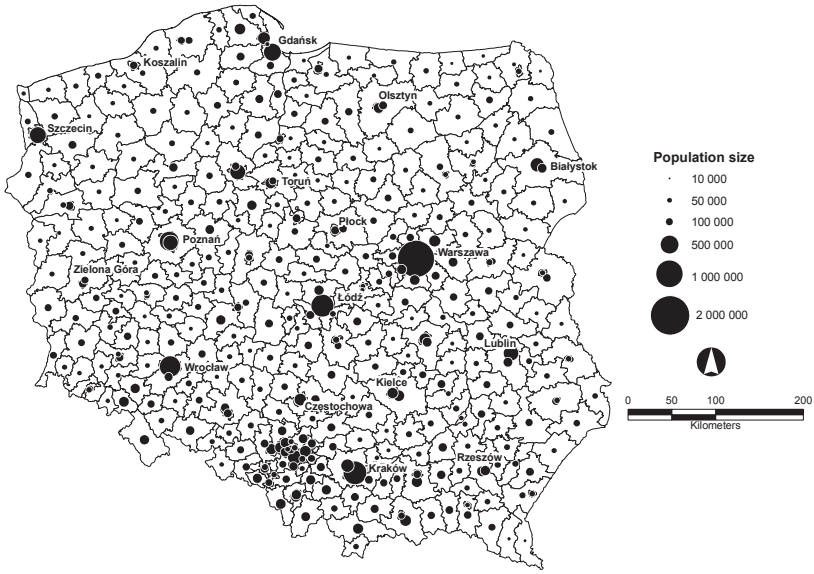

Figure 1.3. Distribution of the Polish population by poviat

Source: own elaboration based on GUS data

The distribution of the Polish population has a strong tendency for creating large population clusters consisting of several neighbouring poviats which form large urban agglomerations. This mainly includes formed agglomerations covering more than two poviats, e.g. Warsaw, Łódź, Katowice, Cracow, Wrocław, Poznań, Bydgoszcz–Toruń and Gdańsk agglomerations. A typical phenomenon is also a band distribution of poviats with high population potential in the south, from Kędzierzyn to Jarosław. Worth noticing is a group of 5 poviats with the highest populations, which include urban poviats: 1. Warsaw (1 715 517 people), 2. Cracow (758 334), Łódź (718 960), Wrocław (631 188) and Poznań (550 742). Observe that each of them has over 0.5 million inhabitants. On the other end of the scale in terms of population, there would be poviats: Sejny (20 963), Bieszczady (22 267), Węgorzewo (23 765), Lesko (26 828)

and Gołdap (27 514). Their populations remain within the 20 000–30 000 range.

The distribution of the population density of Polish poviats, which reflects the relations between natural environment and population, is a result of previously discussed distribution of the population (Figure 1.4). This is where the similarity of basic properties of distributions stems from. Population density seems more spatially diverse (V = 178.2%). Its huge area of diversity is also interesting, spanning from 20 (Bieszczady poviat) to 3935 people per 1 km^2 (Świętochłowice urban poviat). This distribution displays also very strong positive asymmetry (A = 2.42) associated with a huge numerical advantage of poviats with density lower than average (379.4) and exceptionally high leptokurtosis (K = 5.43). Additionally, population density of poviats is moderately negatively correlated with their area (r = –0.600) and positively with their population (r = 0.491).

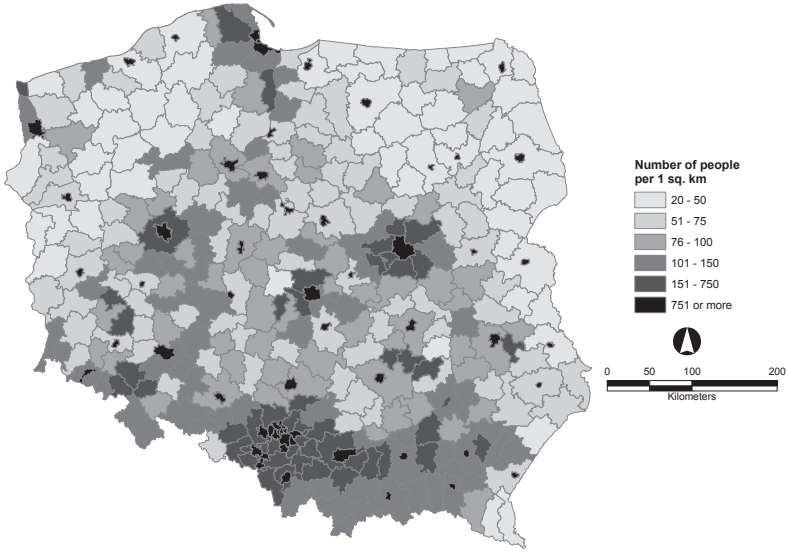

Figure 1.4. Population density in Poland by poviat

Source: own elaboration based on GUS data

Poviats with high population density are located within a triangle which base is located near the country's southern border and which tip is located near Gdańsk. Population density often exceeds there 150 people per 1 km^2. This area is also the most urbanised area in the country. Exceptionally high concentration of population is mostly featured in urban agglomerations, particularly their node areas. Outside the triangle, in predominantly rural areas of low economic activity, researchers have observed a sharp drop in population density (< 50 people per 1 km^2) towards peripheral areas.

1.3.2. Definitive internal migrations

The distribution of the value of the migration net ratio in poviats is highly diverse (V = 471.6%), displaying strong positive tendency (A = 2.16) and slenderness (K = 6.74).

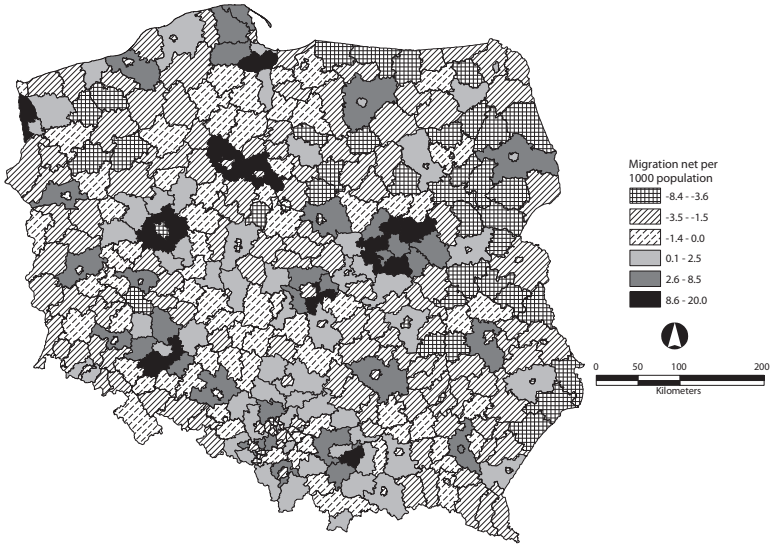

Figure 1.5. Migration net in permanent inter-poviat migrations in Poland

Source: own elaboration based on GUS data

For 25% of poviats, its value does not exceed –2.79‰, –1.59‰ for 50% of poviats and 0.22‰ for 75% of poviats. At the same time, the ratio is highly positively correlated (r = 0.829) with inflow coefficient and weakly negatively correlated (r = –0.28) with outflow coefficient.

High positive values of migration net ratio (> 2.5‰) are mainly related to zones of intense influence of large cities and urban agglomerations (Figure 1.5). The situation of areas located between such zones is unfavourable considering high negative values of migration net ratio (< –3.5‰). This mainly applies to the so-called eastern wall and to a lesser extent to western border regions and peripheral areas of large urban regions. It is worth adding that the balance of inter-poviat migrations per 1000 people differs countrywide similarly to intensity of the population's spatial mobility, measured with the migration turnover ratio and migration effectiveness which is defined as the relation between migration balance and migration turnover.

1.3.3. Demographic development and forecast

Demographic development. Demographic growth and its spatial variability depend on, e.g. the level of economic and social development, the quality of technical and social infrastructure, the development of services, transport network and communication. The development of poviat populations in 2012 has been described using the population growth ratio. Its average value of –0.81‰ clearly indicates a dominant national depopulation tendency. The distribution of its value per poviat displays exceptionally high variability (V = 611.8%) with relatively high rightward asymmetry (A = 1.50) and slenderness (K = 3.87).

Within the country, there are regions with significantly favourable demographic situation resulting from a high (> 3.5‰) positive intensity of population growth (Figure 1.6). Those are mainly poviat clusters located near large urban centres. Outside them, mainly in

rural areas, depopulation processes are predominant. They are the highest in a large part of voivodships: zachodniopomorskie, łódzkie, świętokrzyskie, warmińsko-mazurskie, podlaskie and lubelskie.

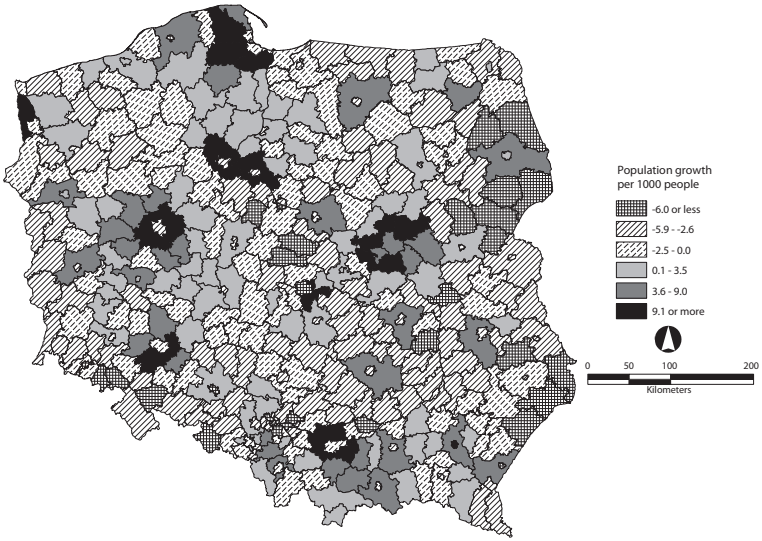

Figure 1.6. Actual population growth in Poland by poviat

Source: own elaboration based on GUS data

Demographic forecast. In the light of the latest demographic forecast by GUS, the average population loss by poviats in 2025 will reach 95.6% of the population of 2011. Since the weakly diverse (V = 7.3%) distribution of the population dynamics index in poviats is rightward asymmetric (A = 1.44), for the majority of them population loss with be higher than average. An upward tendency of demographic growth will cover central sections of large urban regions excluding their capitals (Figure 1.7). Population growth will often exceed there 10% of the initial population size. Extensive stretches of demographic growth will occur in poviats located along the Bielsko-Biała–Tarnów and Gdańsk–Bydgoszcz–Poznań–Zielona

Góra lines. On the other hand, extensive areas of population loss will occur in the Łódź region and its vicinity as well as in: zachodnio-pomorski, pomorski, warmińsko-mazurski, podlaski, lubelski and świętokrzyski regions. For them, population dynamics indexes will often be lower than 90%. Large coverage of depopulation areas and considerable scale of population loss will pose a serious threat for their socio-economic development. Depopulation tendencies will spread further until 2035.

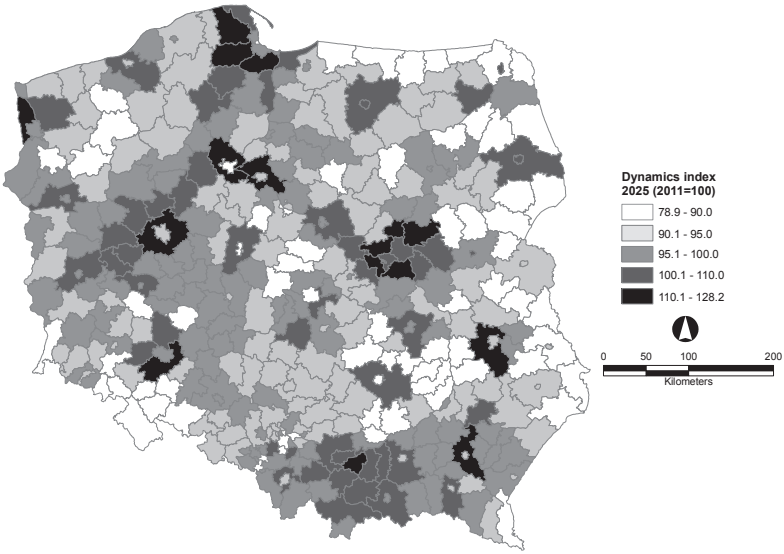

Figure 1.7. Demographic forecast for Poland for 2025 by poviat

Source: own elaboration based on GUS data

1.3.4. Population reproduction

Formation and breakdown of marriages. The study of spatial transformations of nuptiality indicates significant spatial differences in the tendencies towards contracting marriage, regardless of the

degrees of data aggregation and their variability over time (Gawryszewski 2005, Barański and Karczmarek 2007, Gałka 2009, Podogrodzka 2012, 2013, Janiszewska 2013b). The current state of spatial diversity of the tendencies to contract marriage in Poland has been shaped by various factors, e.g. the current demographic situation, which is a result of the events of previous years, economic changes, new regulations and the society's world-view transformations.

The marriage rate per 1000 people in 2012 ranged from 4.3‰ in Świnoujście to 6.8‰ in Limanowa poviat. Poviats the inhabitants of which displayed the lowest tendency to contract marriage (below 5‰) constituted 15% (58 poviats) of all administrative units, while the share of poviats where the tendency was the highest, above 6‰, was 12% (46 poviats). Both in the case of poviats with the highest and the lowest tendency to contract marriage, there are several areas of similar nuptial tendencies. The lowest values can be found in cities and in highly urbanised areas and in eastern and north-western Poland. Poviats with the highest frequency of contracting marriage can be found in various parts of our country while their biggest clusters are located in central-eastern, southern and central-northern Poland (Figure 1.8).

Spatial diversification of the divorce rate is considerably different from the spatial distribution in the case of marriage formation. There is a very strong division of the country into eastern and south-eastern parts with low values of the divorce rate and western and northern where the most divorces are recorded (Figure 1.9). The most extreme values of the rate recorded in individual poviats were 0.45‰ in Limanowa poviat and 3.42‰ in Gorzów urban poviat.

The current spatial distribution of the rate has remained unchanged since the 1950s, which means the majority of divorces have occurred in northern and western regions of Poland. Higher numbers of divorces in the so-called territories reclaimed after World War II are attributed to migration-based formation of the population inhabiting them and higher frequency of new marriages at that time which statistically resulted in more divorces. In former territories, particularly those of the former Poznań and Rzeszów provinces, the divorce rate was one of the lowest in the country both in the first

post-World War II period and in the following years. Currently, the causes of spatial diversification of divorces can be attributed to, e.g. higher level of religiousness and devotion to traditional values common in sub-regions of southern and eastern Poland.

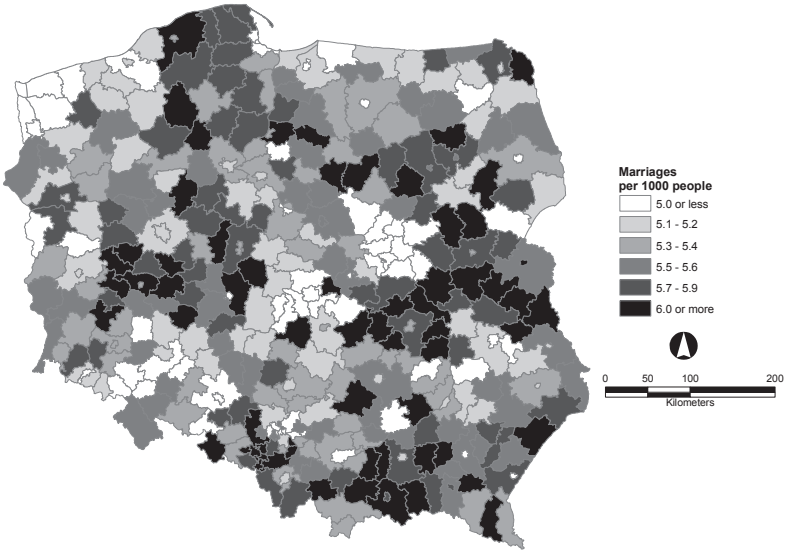

Figure 1.8. Intensity of marriages in Poland by poviat

Source: own elaboration based on GUS data

Natural increase. In 2012, the natural increase rate in Poland was near nil. Considering its spatial diversification, one must consider the fact that in nearly 47% of poviats (177) it was negative, with the lowest value in the Hajnówka poviat: –8.1‰ (Figure 1.10). Therefore, natural loss applied to nearly a half of Polish poviats and its highest values were recorded in regions: łódzki, podlaski, lubelski, dolnośląski and śląski. The highest natural increase rates exceeding 3‰ was recorded in 31 poviats lead by Kartuzy poviat with 7.6‰. The remaining poviats with high natural increase covered an area stretching from the Poznań agglomeration, through Bydgoszcz–Toruń agglomeration to Tri-City and Małopolska Province.

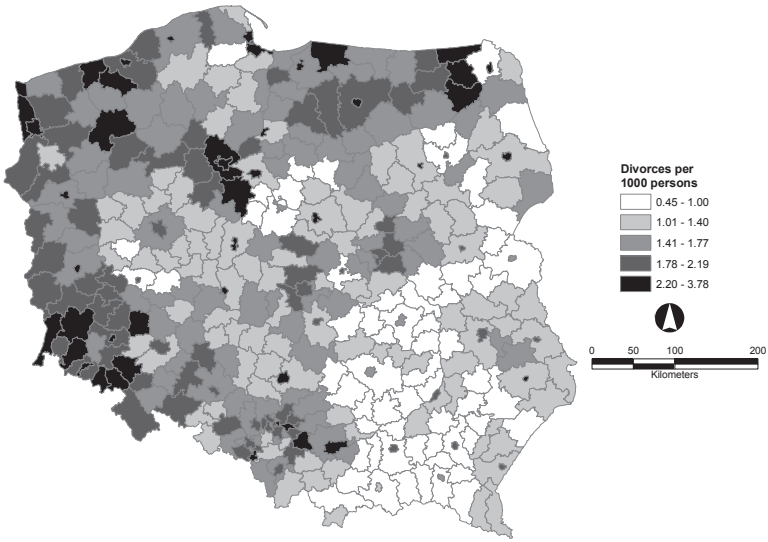

Figure 1.9. Intensity of divorces in Poland by poviat
Source: own elaboration based on GUS data

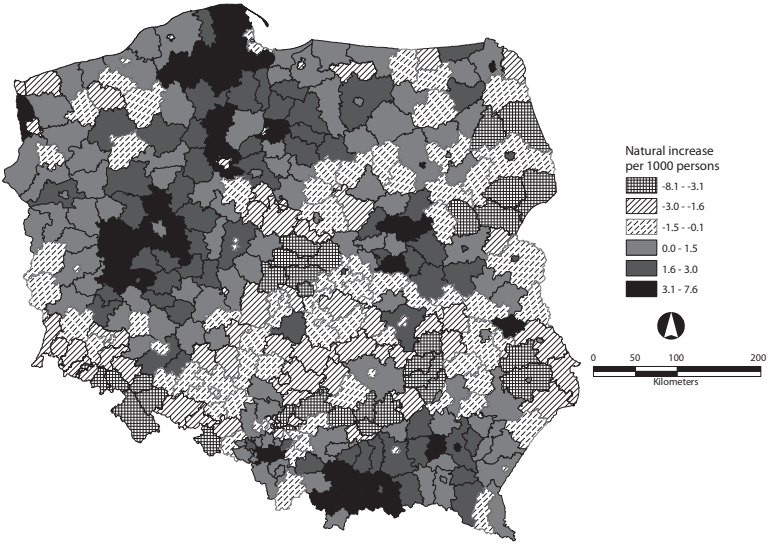

Figure 1.10. Intensity of natural increase in Poland by poviat
Source: own elaboration based on GUS data

1.3.5. Demographic structure

Sex structure. Feminisation is distinctly associated in our country with urban areas (Figure 1.11). For many years now, the feminisation ratio has been the highest in Łódź where in 2012 there were nearly 120 women per 100 men. Similarly high values of the ratio were recorded in other cities, e.g. Warsaw (118), Lublin (117), Sopot (116), Kalisz (115), and Poznań (115). Numerical predominance of the male population over female population exists only in 16 Polish poviats with the highest masculinisation ratio in Sejny poviat where per every 100 men there are only 96 women.

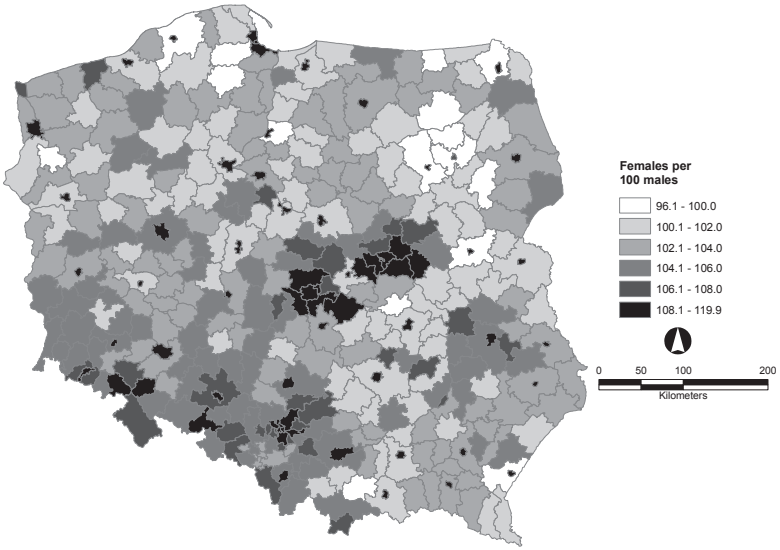

Figure 1.11. Feminisation ratio of the Polish population by poviat

Source: own elaboration based on GUS data

Age structure. One of the results of changes in natural movements and population migrations are changes in the population age structure which usually lead to population ageing. The process of ageing of the Polish population is spatial diverse which is confirmed

by specific indicators, i.a. demographic ageing indicator and demographic dependency indicator. It is a process the course of which is not uniform throughout the country and which influenced by not only contemporary demographic and socio-economic phenomena, but also demographic past.

Demographic ageing is an important indicator for the analysis of the process of population ageing. It is based on two age groups: the youngest and the oldest, and its construction is based on the relationship between the number of the older and the youngest populations. The higher its value, the more unfavourable (older) age structure of a given population is. The value of the demographic ageing indicator for poviats in 2012 ranged from nearly 46 to over 221. Regions with the least favourable age structure included poviats of regions: łódzki, podlaski, śląski, opolski, dolnośląski and a part of lubelski (Figure 1.12) while the poviats of Pomorskie Province constituted a rather consistent area with the most favourable age structure.

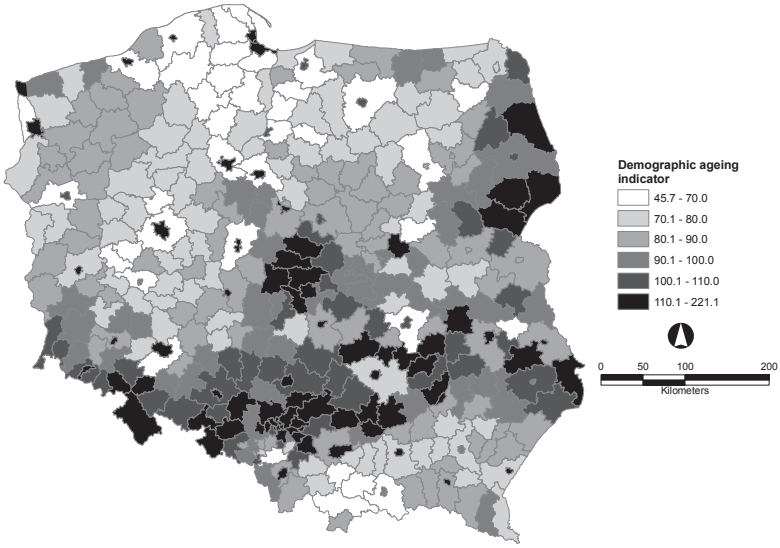

Figure 1.12. Demographic ageing of the Polish population by poviat

Source: own elaboration based on GUS data

Spatial distribution of the values of the demographic dependency indicator for working age population reflects the demographic division of Poland into younger north-western part and older central-eastern (Figure 1.13). Poviats with the highest and the lowest values of demographic dependency differ by nearly 20 points.

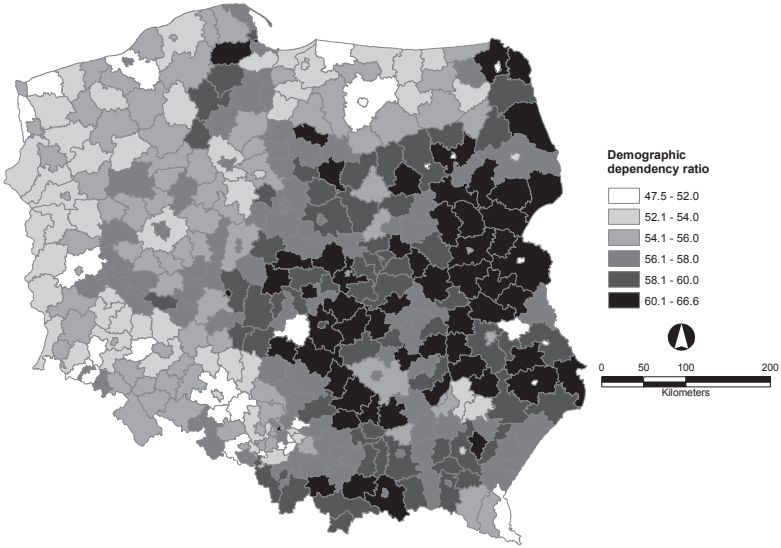

Figure 1.13. Age dependency of the Polish population by poviat

Source: own elaboration based on GUS data

1.3.6. Spatial demographic typology

Study method. The synthetic approach towards studied demographic features forming different spatial arrangements constitutes a separate study problem. For that end, the authors developed a spatial demographic typology. It included all 379 Polish poviats according to the status in 2012.

The developed spatial typology of the Polish population has been based on typological variables selected using three groups of criteria: content-related, formal and statistical. Upon appropriate selection, the authors finally adopted 15 typological features assigned to individual poviats in 2012: 1. Population size; 2. Population density; 3. Migration inflow ratio; 4. Migration outflow ratio; 5. Migration net ratio; 6. Actual population growth ratio; 7. Marriage ratio; 8. Divorce ratio; 9. Natality ratio; 10. Mortality rate; 11. Natural increase ratio; 12. Feminisation ratio; 13. Share (%) of people at pre-working age within total population; 14. Share (%) of people at working age within total population; 15. Share (%) of people at post-working age within total population.

The majority of the features (12) display high or very high spatial variability. This means that they carry large information loads regarding poviat demographics. For the development of the typology it seems favourable that high relations ($r > 0.8$) between specific typology feature pairs occur rarely (7).

The spatial typology of the Polish population was developed using the k-means clustering method developed by J. MacQueen (Grabiński 1992) based on its variation developed by D.N. Sparks (Anderberg 1973). Its application was preceded by empirical standardisation of typological feature values and calculations were performed using SPSS statistical software.

Results of typological research. Using the above-mentioned method the authors established that the best separability of poviats was achieved by defining 10 clusters associated with demographic spatial types (Figure 1.12). The authors have assigned name related to particularly significant (nationwide) typological features to individual types related, i.e.: type 1 – very high share of working age population, high intensity of divorces and rather high migration outflow, type 2 – exceptionally population growth, very high intensity of migration net convergent with high intensity of migration inflow type 3 – very high share of pre-working age population and intensity of natural increase with high natality, type 4 – enormous demographic

potential, exceptionally high population density and very high feminisation, type 5 – very high mortality, high share of post-working age population, type 6 – large population resources, high population density and feminisation ratio, very high intensity of divorces, type 7 – high population density, very high intensity of migration outflow, high feminisation ratio and high intensity of divorces, type 8 – very high natality and natural increase and exceptionally big share of people at pre-working age, type 9 – very high intensity of migration net with very high intensity of migration inflow, very dynamic demographic growth, type 10 – high share of people at post-working age, very high mortality and very high divorces ratio.

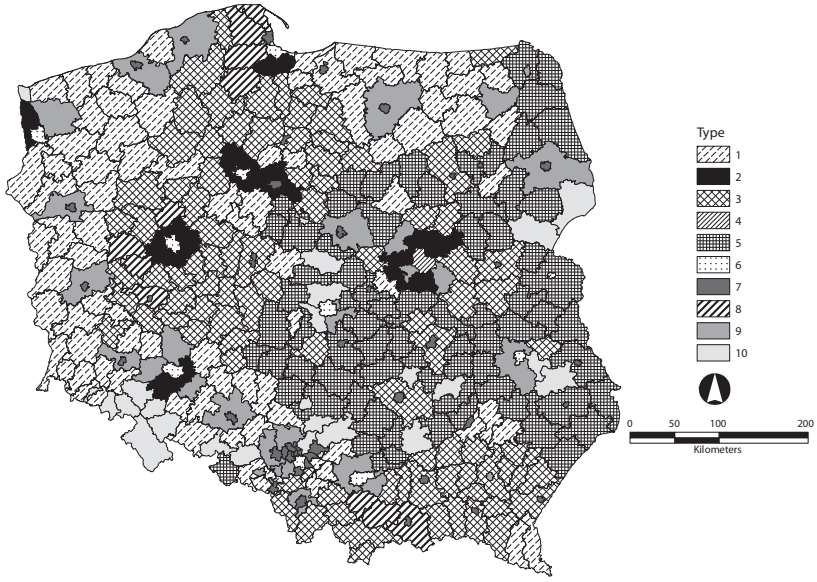

Figure 1.14. Demographic typology of poviats in Poland

Source: own elaboration

1.4. Conclusions

At the turn of the century, Poland witnessed an important change in the distribution of the population, i.e. concentration of the population in metropolitan areas, movements from central cities to surrounding areas (suburbs) and depopulation of peripheral areas. Within the analysed period, there has been a significant outflow of the Polish population abroad, particularly from the eastern part of the country and from Opolskie region. Additionally, low total fertility rate influenced low natural increase, except suburbs where a rise in the natural increase rate was recorded. The changes to migration intensity and directions and of the diversification of natural increase along with passing through the population pyramid consecutive generations of baby boomers and people born in demographic lows result in more rapid ageing of areas which until recently were considered as demographically young (i.e. northern and western Poland) and urban areas.

In the coming decades, the on-going demographic processes will result in even greater spatial polarisation between metropolitan and peripheral areas. If continued, the depopulation tendency resulting from low natural increase caused by low fertility and increasingly delayed time of establishing a family as well as emigration of young people will lead to further deepening of demographic ageing as a result of a drop in the percentage of pre-working age population, diminished work resources and increased share of retired people. Therefore, it is important to undertake certain population policy actions to strengthen the elements of pro-family policy, develop social policy targeted at older people and initiatives aimed at increasing economic activity particularly of people age 50+ (*Sytuacja demograficzna Polski* 2012). The main assumptions of population policy-marking directions for initiatives aimed at achieving sustainable socio-economic development were developed by the Government Population Council and adopted during the 2nd Demographic Congress in 2012 and their implementation will depend on the country's economic situation.

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