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FLUCTUATIONS IN THE DEVELOPMENT OF CITIES. A CASE STUDY OF LODZ

Abstract: Lodz is one of cities undergoing a severe depopulation process. The scale of the phenomenon as well as its persistence poses a threat to the functioning of both the city and its region. In view of the analysed data (number of residents, own income) Lodz looks unfavourable when compared to its surroundings. Not only does it exhibit the biggest outflow of residents, it shows relatively weak growth dynamic of its income. If Lodz will develop in the same direction as other postindustrial cities like Manchester, it will have to face an even deeper depopulation.

According to Klaassen's urban life cycle model, Lodz and its surroundings are undergoing deurbanisation. At the same time, the cyclical nature of the fluctuations in population development, followed by population growth reaching progressively higher values is similar to model of economic growth in the very long run [Day, Walter 1993].

Key words: Depopulation, deurbanisation, Lodz, shrinking cities.

Introduction

Most of Polish cities included in the political transformation after 1989 underwent an economic "shock" which impacted every sphere of their activities (social, economic, functional, *etc.*). This in turn stimulated them to adapt their economies to the new conditions. Today many of the cities, after years of stagnation or decline, have found their ground and rebuilt their potential. Others have struggled with negative processes (decline of business activity, depopulation, degradation of land development, *etc.*) to this day.

One of the cities affected by a rapid depopulation process is Lodz, up to recent times the second and now the third most densely populated Polish city. Lodz is an important point on the map of Poland whose roles include the capital of the voivodeship and the major city of the Lodz Urban Agglomeration. It is often presented as a metropolitan centre on a national level. Strong ties established between Lodz and its surroundings during the 19th century industrialisation process resulted in the creation

of a monocentric urban agglomeration. Hence the depopulation of Lodz is important not only for the functioning of the city but also for its surroundings. The scale of the depopulation process in Lodz and the longevity of the trend may pose a threat to the functioning of the entire region. This problem is reflected in opinions which confirm that Lodz is in the initial phase of deurbanisation [Lisowski, Grochowski 2013, p. 226]. Information about the current evolution of the region is essential to ensure adequate functioning of the city and its environment, provide for the livelihood needs of the residents of the area, ensure the development of Lodz as a metropolitan centre, especially in the context of the planned duopolital co-operation with the Warsaw metropolis, and support the EU sustainable urban development policy.

1. The subject and spatial scope of the analyses

The level of urbanization in Poland has been gradually decreasing for the past few years, from 61.9% in the mid- to late 90s to 60.6% in 2012 (Fig. 1)¹. However, it is believed that statistical data only outwardly seem to confirm the slow-down of urbanization (or the initial phase of deurbanisation). In reality, the urbanisation process across the country is progressing but a large part of the migration to urban and suburban areas is not registered (statistical data are collected for cities within their administrative borders, excluding their functional areas [Rozwój miast w Polsce... 2010, pp. 25-26].

Poland has regions with both increasing and decreasing population. Lodz belongs to the latter category as one of the communes with the largest absolute decrease

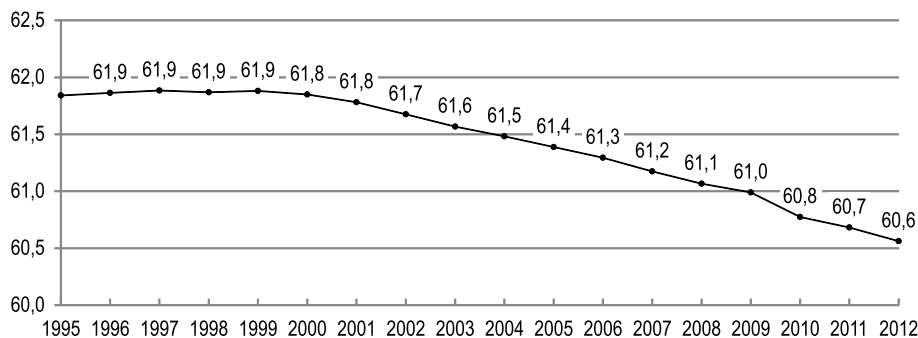


Figure 1. Percentage of urban population in Poland in the years 1995-2012

Source: Own work based on GUS (Central Statistical Office) data.

¹ These values are markedly lower than those in highly developed countries. According to the World Bank data, urbanization in 2012 r. was 87.1% in Denmark, 86.3% in France, 74.1% in Germany, 79.8% in the UK, 77.6% in Spain (<http://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS> accessed on 28 July 2013).

of the number of residents (Fig. 2). In the years 1995-2012 the city lost 104 thousand residents (12.7% of its population). The declining trend is stable and the number of residents decreases by a few thousand people every year. Although the fluctuations of residents and the changes in the spatial distribution of the city’s population are an element of its evolution, such a long-term depletion of its population is a detrimental and alarming phenomenon.

The spatial behaviours of the population are a key element in the identification of the city’s status in its development cycle. According to the urban life cycle model, after the urbanisation stage, the city enters a stage of a relative suburbanisation if due to internal redistribution the population growth is bigger in the suburban area than in the central city. However, a decrease in the number of residents in the central city indicates an absolute suburbanization stage [Lisowski, Grochowski 2013, p. 226]. If the rapid population decline result in an absolute decrease of the number of residents of the entire urban agglomeration, it means a deurbanisation process has taken place. As a consequence – when the increase in population of the suburban region cannot balance out the population decline in the central city – the existence of the city is in danger. If the residents leave the city, schools, shops and medical facilities soon follow. The diminished access to the centre may result in relocating offices to more accessible parts of the city such as suburbs, or even further – outside the agglomeration area [Klaassen 1988, p. 51].

Lodz and its surroundings form a certain territorial system whose scope varies according to the scientific approach used by individual researchers. Even individual terms, such as the Lodz Urban Agglomeration, Lodz Metropolitan Area, Lodz Urban

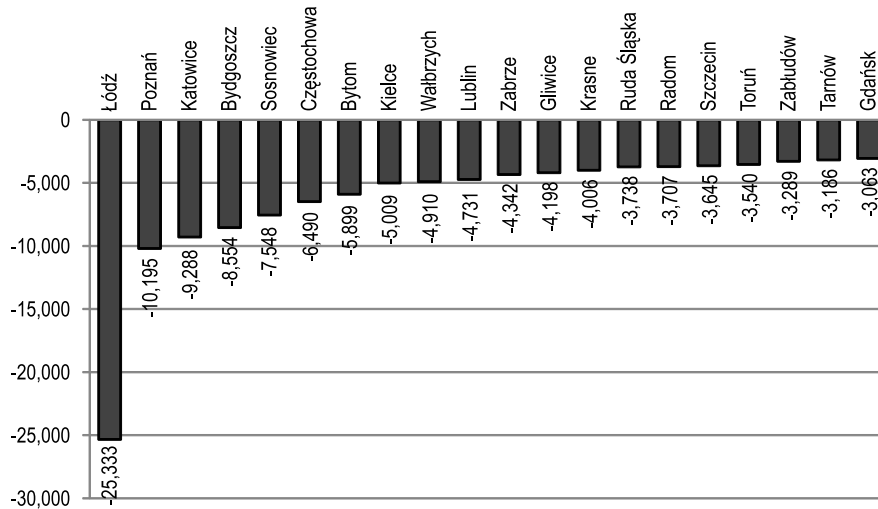


Figure 2. Communes in Poland with the largest decline of the number of residents in the years 2003-2007

Source: [Rozwój miast w Polsce... 2010, p. 29].

Functional Area or peri-urban agricultural areas are spatially demarcated in various ways. The borders change according to the researcher and the criteria they adopt for their studies, as well as the features of the system which change with time, such as the development of functional-spatial relations. This article analyses Lodz (considered the core city) and the communes which form its first- and second-order neighbourhoods according to the common border criterion. First-order neighbourhoods are limited to the immediate neighbours, second-order ones are the communes neighbouring with the primary surroundings. This area consists of 27 territorial units: the city-district of Lodz (NUTS4) and 26 communes (NUTS5; communes of urban-rural character were treated as unified territory). It mostly corresponds to the Lodz Metropolitan Area and the Lodz Urban Functional Area (Fig. 3). Apart from Lodz, it encompasses 11 cities forming the Lodz Urban Agglomeration².

The spatial scope of the analyses was founded on the hypothesis, based on Tobler's law, that distance plays an essential role in mutual relations, impacting population flows (diffusion) among territorial units.

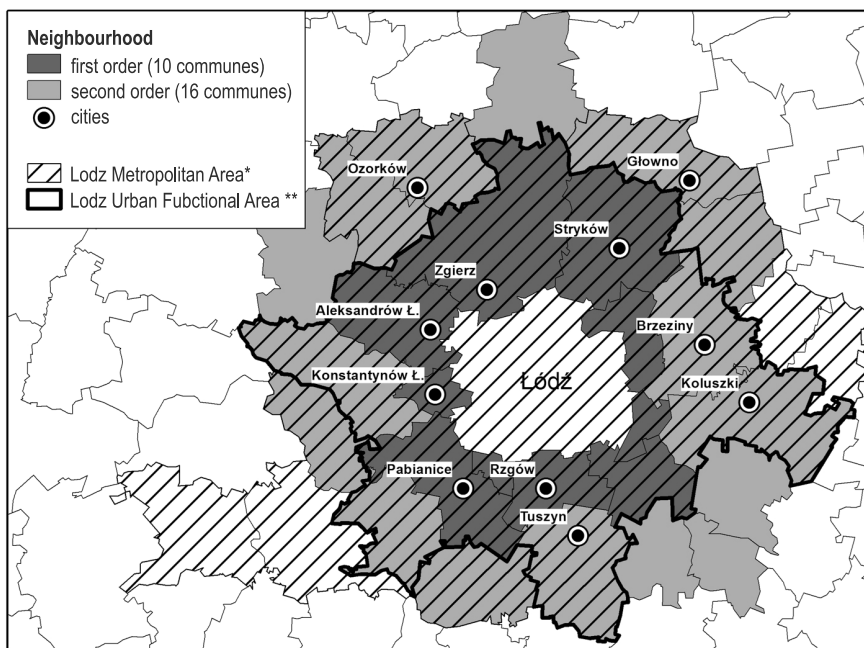


Figure. 3. Cities and communes in the Lodz neighbourhood

*Based on [*Plan zagospodarowania...* 2010, p. 221]. ** Based on [*Kryteria delimitacji...* 2013, p. 17].

Source: Own work.

² The number of cities forming Lodz Urban Agglomeration varies according to each author from 5 to 13 centres (excluding Rzgów, which regained municipal rights in 2006) [see Liszewski 2001, p. 241].

3. Population changes in the researched area

The origins of depopulation in Lodz stem from the economic conditions resulting from the Socialist economic policy³. During the political transformation after 1989 the economic basis of the city's functioning collapsed. The situation in Lodz at that time (the decline of industry, loss of jobs, impoverishment of the local communities, degradation of land development, emigration, *etc.*) was typical for monofunctional industrial cities. In the recent years (2002-2012), the number of city residents decreased by an average 6.6 thousand per year to reach 719.0 thousand people (Fig. 4). The 2005 GUS forecasts presume the trend is going to persist to the end of the time period covered by the forecast (2030) and Lodz will have 708 thousand residents in 2015, 675.8 thousand in 2020, 641.7 thousand in 2025, and 605 thousand in 2030 [*Perspektywy demograficzne...* 2005, p. 13]. As a result, the number of residents is supposed to plummet from 2012 to 2030 by over 100 thousand, 218 thousand less when compared with the state from 1995. That means a decrease in population by 25%. It should be noted that the population's decline is an effect of natural movement (an average of -4.5 thousand people a year).

The depopulation in Lodz is accompanied by an influx of new residents to the neighbouring areas. Especially the first-order neighbouring communes exhibit a large growth of population, with the number of residents rising by more than 9 thousand (Fig. 5). Nevertheless, the overall result for the analysed region is not beneficial. The number of residents in the core area is falling at such a rapid pace that the population growth in the surrounding areas cannot compensate it.

The scale, scope and stability of the depopulation process indicate deurbanisation processes in Lodz are taking place. The graphs illustrating the population fluctuations in Lodz, the entire region and the ring of the directly neighbouring communes

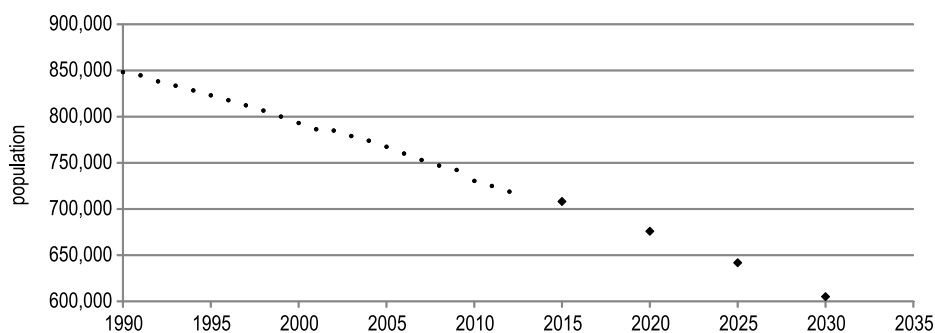


Figure 4. Population development in Lodz in the years 1990-2030 (forecast for 2015-2030)

Source: Own work based on GUS data.

³ Including the command-and-quota system, elimination of the private sector, expansion of the heavy industry the state's monopoly on international trade, and high external debt.

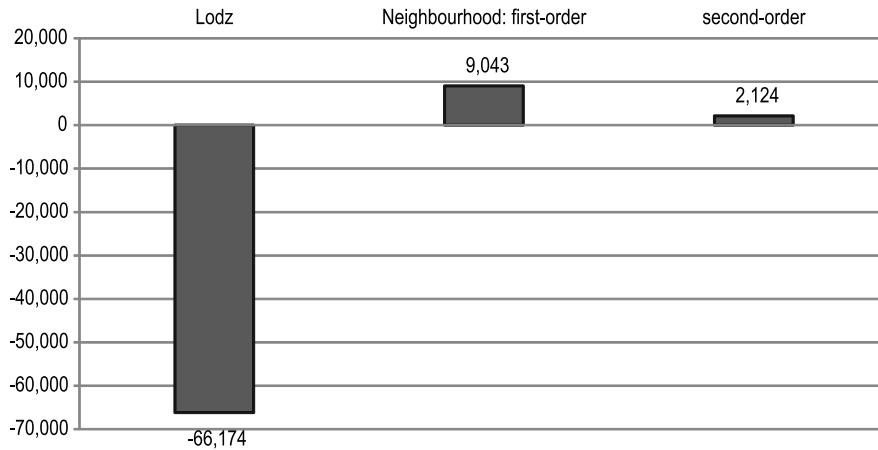


Figure 5. Population changes in the researched area in 2002 and 2012 r.

Source: Own work based on GUS data.

(although in this case the curve rises a little), point to the fact that the whole region is on the brink of this stage of urban development (Fig. 6).

The population fluctuations in Lodz can also be analysed in comparison with other industrial cities. Especially the comparison with Manchester, a place Lodz, “the Polish Manchester”, is often likened to (both cities have preindustrial origins but owe their rapid development to the textile industry), leads to interesting conclusions (Fig. 7). The line illustrating Lodz’s population development is almost identical to the equivalent line for Manchester. The difference between the moment where the population development in the respective cities collapsed (the stage shift) is about 60 years.

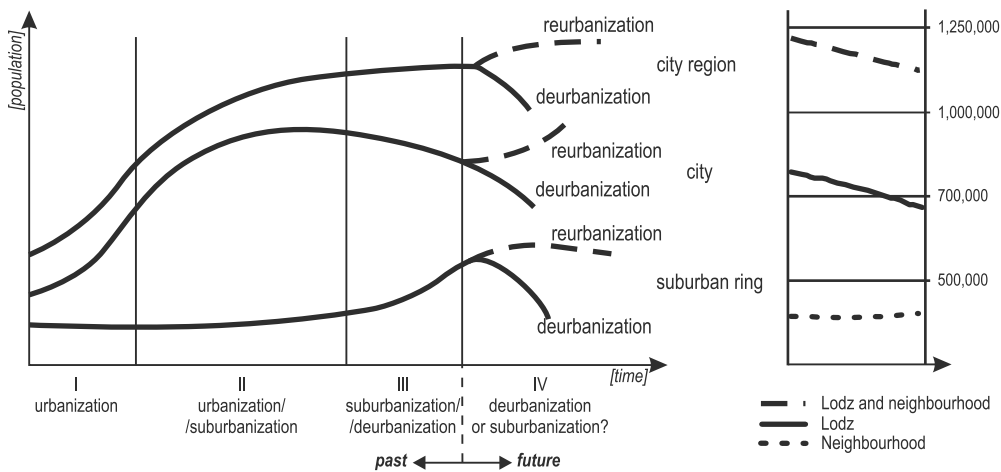


Figure 6. The development of the study area in the light of the stages of urban development by Klaassen

Source: Own work based on: [Klaassen 1988, p. 52 and GUS data].

The time period is similar to the duration of socialist state in Poland. Moreover, the fact that Lodz industry collapsed later than Manchester's can also be explained by the hindering effect of both World Wars and the support offered to industry by the state interventionism policy during the period of centrally planned economy.

If the direction of Lodz's development follows that Manchester, the Polish city may expect further long-term and profound depopulation. In Manchester, the decline between the city's developmental peak and the trend's turning point amounted to around 340 thousand people. For Lodz, this difference means going down from 854 thousand residents in 1988 (the year after which the city's population started to fall) to around 500 thousand. However, if relative values are taken into account (in Manchester the decline was 44.8%) the population of Lodz may fall to around 380 thousand.

The city's functioning may be evaluated within a much broader time span. The curve reflecting Lodz's population development in the recent years (Fig. 7) is loosely based on Day and Walter's economic development model (1993 p. 253-289). According to the model, in a very long run, economic development is shaped by the interactions among development factors such as population, productivity, technology, and social infrastructure. Every stage (regime) of development consists of growth, collapse and turnaround (turning point) followed by further growth after the lowest fluctuation (Fig. 8). Although the individual stages of development presented in the model are related to the division into groups or a technostructural turn, its assumptions, as Domański [2012, p. 179] writes, may help – after making them more specific – to create an evolution model for urban agglomerations.

The cyclical nature of the fluctuations in Lodz population, which are followed by an ever-growing population growth, is similar to that observed in the theoretic model.

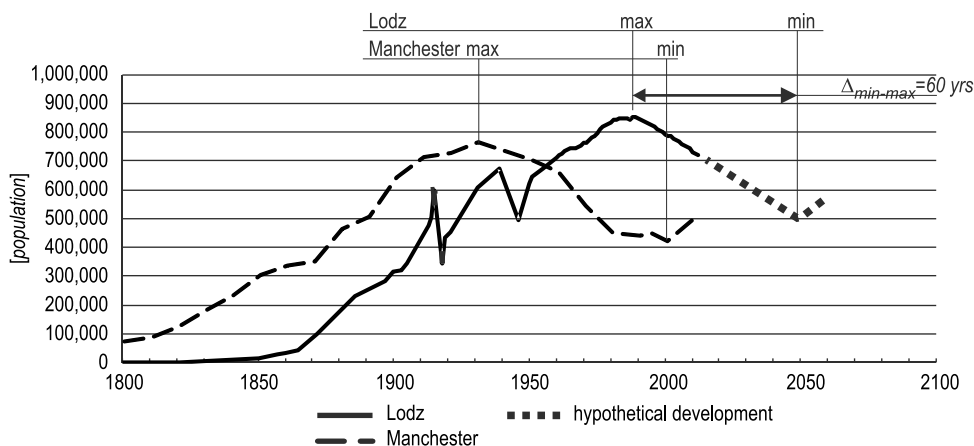


Figure 7. Population development in Lodz and Manchester in 1800-2011 (forecast for Lodz up to 2030 according to GUS)

Source: Own work based on: GUS data, Manchester's Population.

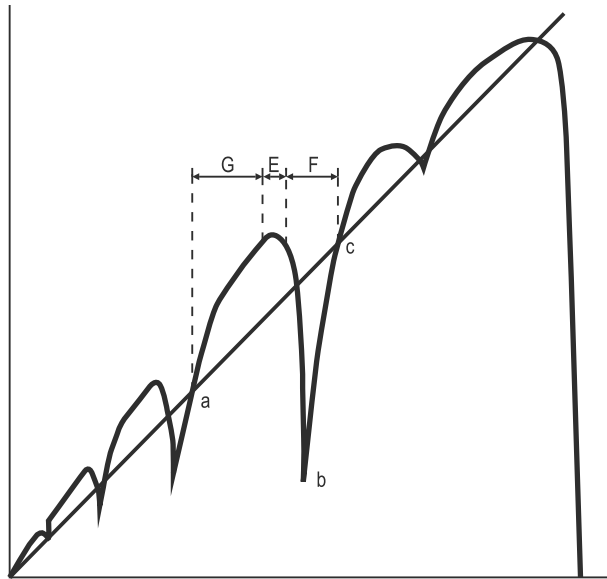


Figure 8. Multi-phase dynamics. Regimes exhibiting a different canonical type of transition possibility
 G - growth, E - turnaround and emigration, F - fluctuations, a - growth barrier transition, b - the deepest fluctuation, c - the start of a new growth period
 Source: [Day, Walter 1989, p. 279 (simplified)].

However, it is difficult to say whether Lodz's development really corresponds to the model presented above, and if so, when the current trend turns around. It is also hard to say if more detailed data from the analysed time periods would have revealed other cycles of Lodz's evolution or whether the opposite is true and the disruption caused by wars should be regarded as the city's natural development cycles. The more so that, excluding the deceleration of population growth as a result of World War I and II, Lodz's development is similar to other industrial cities, less ruined by the wars, where one significant fluctuation happened in the last two hundred years (Fig. 7). Nevertheless, this model shows that the processes in Lodz may be treated as another part of its development.

3. Dynamics and spatial differentiation of the territorial system in Lodz

The system of the city and its surroundings is constantly evolving with each new wave of immigrants, businesses, capital, jobs, information, *etc.*⁴ Individual ter-

⁴ Defining system as a set of objects together with the relations among these objects and their possessions [Hall 1968, p. 93], any city, region, agglomeration and other socio-economic territorial structure may be treated as a system.

territorial subsystems shape and adapt to volatile conditions, and their authorities (local governments) make ad hoc more or less accurate decisions about the functioning of individual facilities or groups. This shapes the development of the entire system (the agglomeration, the region), which encompasses individual and group behaviour of people and businesses. Their decisions (including spatial ones) sum up and even out, influencing the direction of the whole system, which in turn, evolving, influences the growth and behavior of all its components.

A system is assumed to be stable if after an imbalance it goes back to its neutral state and unstable if after the imbalance it deviates from this state. Disruptions in the systems' balance are a natural part of their evolution and are not perceived as negative or unwanted. Studies from the point of view of evolutionary economy suggest that economic growth is not a result of balance, and the economy can work in an imbalanced state. They also note that the economic growth is more a product of a constant transformation than a convergence to steady growth, and that evolutionary processes are composed of transitions and phase transitions [Domański 2012, p. 9].

The evolution of systems is a series of their instabilities and phase transitions leading to transformations of their structure. Due to external factors, the system becomes unstable and that starts the transition towards a new style of behaviour (phase transition). This is accompanied by inevitable fluctuations (*ibidem*, p. 31). Nevertheless, it is hard to reasonably judge, when a system (urban, regional) loses its self-organisation sense and when the balance may be restored. Steering such complex systems as cities in between periods of relative stability is extremely difficult if not downright impossible, even in wealthy societies (the Detroit case). Despite that, monitoring the evolution of socio-economic systems is especially important. Lack of an appropriate reaction form the authorities, especially the central ones (the needs usually outnumber the possibilities of the local ones) may lead to their deep collapse. As a result, the dysfunction of cities, agglomerations and regions may evolve into a long-term inability to fulfil a role in the national system, severely impacting its functioning. This process leads to the emergence of depressed problem areas, which need long, expensive preventive and corrective actions⁵.

Lodz and its surroundings may be described as a system which, population-wise, after almost 25 years since the political transformation is still in the unstable phase. An attempt was undertaken to analyse the evolution of Lodz and the neighbouring primary and secondary communes from 2002 to 2012 at the NUTS5 level using widely accessible statistical data. The analysis focused on the dynamics of the territorial units' own income compared to the dynamics of the population processes.

⁵ In the cores and peripheries theory, J. Friedmann identified, apart from core regions, development axes and border regions, depressed regions which show economic stagnation or decay and depopulation [Friedmann, Alonso 1964, p. 3-4]. A problem area has a low effectiveness of socio-economic and spatial structures. Therefore, it needs special urban planning and local policy solutions to eliminate the existing problems [Bański 2011, p. 7 as cited in: Ciok 2004].

These are one of the major factors determining socio-economic development. Specific spatial behaviours of the population are characteristic features of individual stages of urban evolution. They may also serve as the basis to assess the attractiveness of the territory in question. Communes' own income, although they are only one of many factors contributing to a territorial unit's condition⁶, prove the resourcefulness of the local authorities and are directly related to the residents' activity and wealth, which is in turn connected to the levels of taxes and local fees. Moreover, own income ensures independence in making own decisions [Ossowska, Ziemińska 2010, p. 78]. There is a feedback between the commune's financial condition (to which own income contributes) and the level of local development understood as a set of qualitative and quantitative transformations in a given area, related both to the residents' standard of living and the level of functioning of business entities [*ibidem*, p. 73].

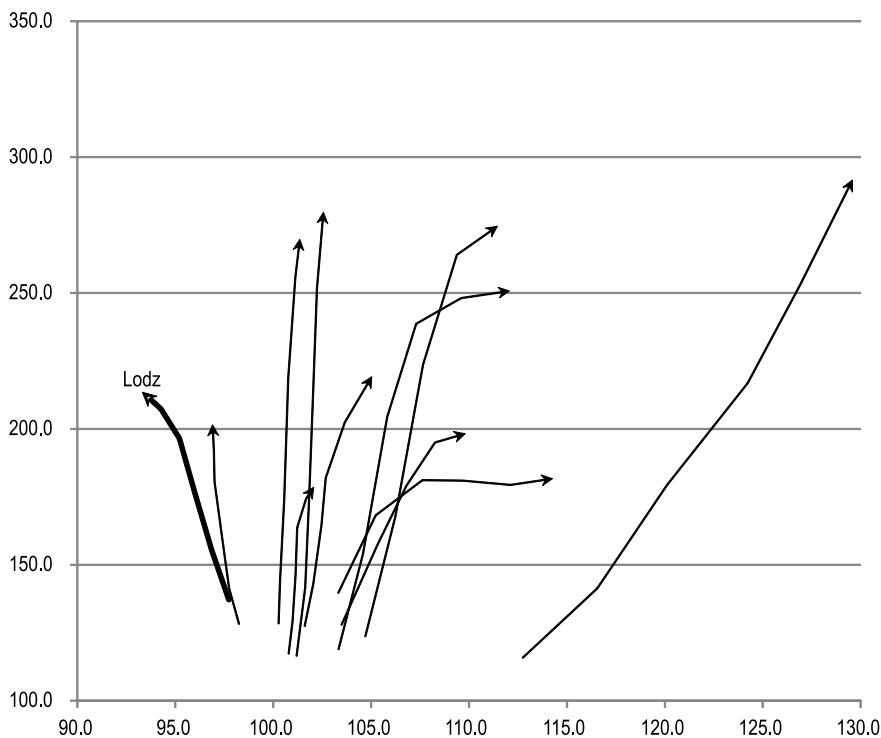


Figure 9. Trajectories of own incomes compared to population development in 2002-2012.
First-order neighbourhood communes.

*Vertical co-ordinate – the dynamics of a territorial unit's own income, horizontal co-ordinate – population changes. Values calculated using moving average (three-year period) year 2002 =100%.

Source: Own work based on GUS data (Figs. 9-11).

⁶ Others include: total income, financial independence, investment expenses, ability to obtain non-budget funds and other.

The examined area contains three categories of administrative units: the ones, like Lodz, experiencing depopulation, ones whose quantitative population potential is relatively stable and ones where the number of residents is growing. The differences between the first-order and second-order neighbouring units are stark. Among the primary units, the only one experiencing depopulation is Pabianice, the second largest town in the immediate neighbourhood of Lodz. The population level is stable in the urban-rural commune of Stryków (located next to the A1 and A2 motorway junction) and in the suburban town Konstantynów. The rest (7 units) exhibits population growth. However, its dynamics varies. The highest level of immigration in the researched area is in the rural commune of Nowosolna (Fig. 9). Most second-order neighbourhood units have a slightly decreasing or stable population. Only four communes exhibit population growth (Fig. 10).

Each commune exhibits a growth of its own income. The most dynamic are first-order neighbourhoods with a stable number of residents and the highest population growth rate. Other units present a weaker dynamics, sometimes with a clear diminishing budget growth trend. It is a characteristic feature of the majority of the communes located in the immediate neighbourhood of Lodz with increasing population. Since the growth of own income slowed down at the end of the analysed period (2008-2011) it is difficult to say whether it was a momentary disruption or the beginning of a long-term trend. It should be noted, however, that these are almost only the communes where the number of residents is increasing.

It is difficult to assess without further research how much the processes taking place in the core city are responsible for the worsening situation in the communes.

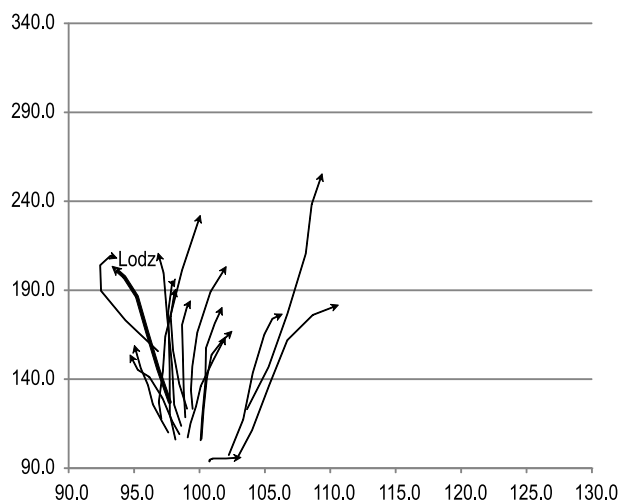


Figure. 10. Trajectories of own income compared to population development in 2002-2012.

Second-order neighbourhood communes

* Vertical co-ordinate - the dynamics of a territorial unit's own income, horizontal co-ordinate – population changes. Values calculated using moving average (three-year period) year 2002 =100%

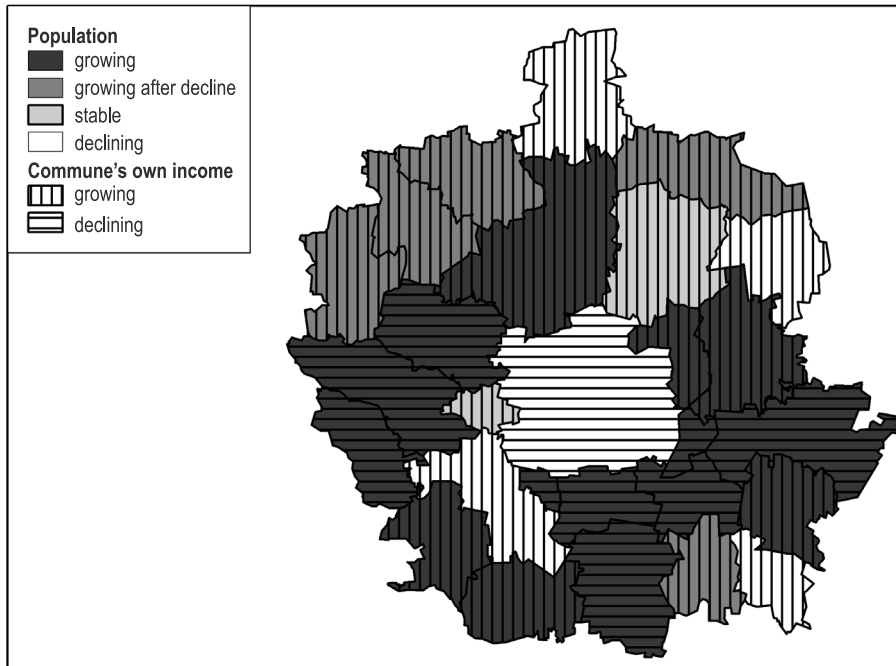


Figure. 11. Population and own income in 2002-2012 in Lodz and its surroundings

Lodz had the worst results from all the first-order neighbourhood units (Fig. 11). Not only was it the most depopulated, it also showed a weak (average) dynamics of own income growth. Lodz seems more similar to its second-order neighbourhood, which exhibit similar or weaker income dynamics coupled with stable or decreasing population. In their case the number of residents falls slightly or stays at the initial level, and the growth dynamics does not exceed 240%.

Summary

In light of the data presented here, the current development directions of the individual territorial units included in the analysed area are very different. The characteristic feature of the analysed data that Lodz, the core city, is among the weaker units, which may destabilize the development of the entire area. The scale and strength of relations throughout the region depends on Lodz. The decline in range of the core city will dissolve the relation between Lodz and its surroundings, which cannot be compensated with relations among the neighbouring areas.

Nevertheless, one cannot assume that Lodz's evolution is going to be a faithful copy of the population growth in Manchester. Every country develops at its own

pace and in its own direction. Knowing the past of industrial cities like Lodz and being able to use the experience in solving this type of crises, one should focus on alleviation and a swift reversal of the detrimental trends. The Lodz authorities see the problem and try to regard the new circumstances as a growth opportunity. Lodz plans to appear more attractive through the duopolital co-operation with Warsaw, new transport solutions (fast trains, access to the A1 and A2 motorways), new urban planning development, the so-called New Centre, and other projects, especially those for trade and housing purposes (Manufaktura Lodzka, Port Lodz, new hotels and lofts in postindustrial facilities). However, some of these solutions pose a significant threat to the city's development, especially the metropolitan co-operation between Lodz and Warsaw. Such a bi-polar system is described in *National Spatial Development Concept 2030* (2011, p. 37,75). Nevertheless, the Warsaw-Lodz relations will not be equal. There is an imbalance of potential and demographic economic and social structure between the cities. Lodz is an aging city, with pronounced depopulation processes, a relatively high unemployment, and a not very dynamic economy. In many analyses on Polish metropolis Lodz falls into the group of cities with less development potential [including Jałowicki 2000; Jałowicki 2005 p. 9 see: Kin-Dittmann, Mika 2004]. Moreover, Lodz is not particularly attractive for investors and foreigners [Smętkowski *et al.* 2009, p. 60]. Due to its administrative functions (main decision-making centre in the country), much larger and better developed set of metropolitan functions and specialised exogenic services as well as better economic situation (as evidenced among others by a higher rate of foreign investment), Warsaw is definitely the strongest partner. It is more competitive because of its function as the Polish capital (decision-making centre, international institutions and company representatives, consulting services, cultural facilities and permanent international events, national transport hub), bigger demographic, academic, educational potential, as well as competitive job resources (highly-educated workforce). In recent years, Warsaw has registered an increase in the number of residents (positive population growth rate and positive net migration rate). Although these differences may offer a chance to build a co-operation whose elements are complimentary rather than competitive, it seems that to ensure the proper functioning of Lodz and its surroundings on the local and national level, it is necessary to – along with the actions aimed at improving Lodz's transport accessibility – prepare and implement mechanisms preventing the stronger partner from using Lodz's potential to its advantage. It is a key matter from the point of Lodz's functioning. Co-ordination of the duopolital co-operation at the functional level is essential, together with controlling the level of complementarity and competitiveness [see Marszał *et al.* 2013, p. 14].

In the current situation, it may be wise to start actions aimed at formulating a regional development strategy which accounts for the tools and solutions used in strategies for regressing regions. Such a strategy should be more elaborate than one for the non-problematic regions. It should propose new goals, conditions of new eco-

conomic structures, management systems which provide solid basis for future jobs and a satisfactory standard of life for a smaller number of residents. It should aim to leave the city economy prepared for the future lower level of population [Domański 2012, p. 34-35].

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