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Differences in the Standard of Living among the Populations of the Cittaslow Network Towns in Poland

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Abstract

The purpose of this study has been to analyze differences in standard of living among residents of the towns which implement the Cittaslow concept in Poland. The research covered two years: 2006 (the year when first Polish towns joined the Cittaslow network) and 2016 and comprised 28 Polish towns involved in this initiative. Hellwig's development pattern method (a multi-dimensional analytical approach) was employed in these investigations. In addition, similarities in standard of living in the above towns were assessed using Ward's method. The research showed relatively large changes between the two years in the rankings of the towns based on a synthetic standard of living level measure, although the top-ranking towns remained in quite stable positions. The highest standard of living among the analyzed towns was detected in Rzgów, Murowana Goślina, Pasym and Olsztynek. The results may inspire further studies into the living conditions of inhabitants living in Cittaslow towns, with a focus on quality parameters.

Keywords: town, Cittaslow, level of living

JEL: I31, R11, D63

Introduction

Contemporary economic and social policy pays special attention to the issues of economic growth and its consequences. The literature confirms that steady economic growth leads to the betterment of living conditions, which translates into higher social welfare (Bywalec 2010, 86; Machowska-Okrój 2014, 410; Śleszyńska-Świderska 2017, 433). Whereas economic growth is typically measured with the GNP per capita, for example, the standard of living is far more difficult to measure due to its being an ambiguous, interdisciplinary concept, which "escapes" simple metrics (Biernacki 2006, 116–119; Turek 2013). On the other hand, measuring the standard of living is an indispensable element of EU policy, which presumes that social cohesion and equal standards of living for all EU citizens should be achieved (Ryszkiewicz 2013, 22–47). Moreover, the paradigm of economic growth is also (and perhaps mostly) viewed with an eye to its possible negative consequences (Cobb, Halstead, and Rowe 1995, 17–34). Negative results of globalization, lack of sufficient care for the natural environment, and a lacking sense of social security are the main issues raised in this context. Thus, publications which describe economic growth in conjunction with its social and economic implications are increasingly appreciated (Czapiński 2012, 51–55; Easterlin 1974, 23; 1995, 37; Stiglitz, Sen, and Fitoussi 2009, 8).

In view of the above considerations, alternative forms of socio-economic growth that emphasize the quality of living conditions are gaining in popularity. Since the early 21st century, the dominant approach has been one where research focuses on well-being, which is a combination of

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some elements of the quality and standard of living (Drabsch 2012, 9–21; Frey and Stutzer 2002, 38–46; Gadrey and Jany-Catrice 2006, 35–57). An example is the concept of a slow city (Li and Li 2015, 1286; Lowry and Lee 2011; Mayer and Knox 2006, 326) and slow life,[1] in which the idea of a network of towns called Cittaslow[2] can be inscribed. The concept of Cittaslow arises from the Slow Food movement and originated in Italy in 1998. The international association can be joined by towns with a population of no more than 50 thousand, which declare a desire to implement the goals of the movement: to make comprehensive efforts to improve the quality of life of their residents. Towns in the network agree to common goals in order to improve the quality of life of their inhabitants and to popularize the "good life" culture. Above all, they concentrate on pro-social and pro-environmental actions, as well as on preserving the unique character of each of the towns by restoring their heritage buildings and maintaining their local handicrafts and cuisine. The idea of Cittaslow also presumes that modern technologies and innovative town management solutions be implemented to ensure that a quiet pace of life does not prohibit constant and well-designed development. The idea of Cittaslow assumes that towns can count on benefits in the natural environment, social, economic and spatial spheres while constantly taking care of the quality of life of their inhabitants (Bekar et al. 2015, 59; Farelnik, Stanowicka, and Wierzbicka 2017, 422). In this case the Cittaslow idea corresponds with sustainability, the global idea, which is appreciated by researchers through the world.[3] Being able to recognize differences in the standard of living among such towns may provide a basis for further, in-depth studies into the social effects of the implementation of the idea of Cittaslow in Poland.

Considering the above, the objective was to analyze differences in the standard of living between populations of the Polish towns centered around the idea of Cittaslow,[4] using a multi-dimensional analytical approach. With the relatively small number of publications dedicated to this subject, this study will contribute to future dissertations. The analysis covered the years 2006([5]) and 2016 so as to capture changes that have occurred in these towns over the past decade. To obtain a synthetic assessment of the differences between the towns, Hellwig's development pattern method was applied (Hellwig 1968). Next, the focus shifted to analyzing similarities between the towns, compared with a synthetic measure of the standard of living. To this end, Ward's method was used. This approach yields readable and graphic presentations of clusters of units (towns) that are similar with respect to the measured feature (the standard of living).

1 Research methods

The standard of living was attested with the so-called synthetic measure of development, with which it is possible to present a situation of regional differentiation in the standard of living, inclusive of numerous socio-economic categories, in an easily accessible manner (i.e., through just one numerical value). This is achieved via the transformation of a multi-dimensional set of data to a single numerical value, typically from a predefined range of values. Thus, the analyzed phenomenon can be described with the utmost clarity. Next, having rearranged these numerical values, it is

1. At the beginning some problems with this term were observed, mainly due to bad associations with the word "slow" in Polish within implementation of the Cittslow concept, which can be understood as a backwardness in development, being obsolete and isolated from other dynamically developing regions, etc.

2. More on this subject at the website of Biuro Polskiej Krajowej Sieci Miast Cittaslow, [@:] http://cittaslowpolska.pl/index.php/pl/o-cittaslow.

3. The 2005 World Summit on Social Development identified sustainable development goals, such as economic development, social development and environmental protection. For more information see: 2005 World Summit Outcome. Resolution/adopted by the General Assembly. UN General Assembly, 24 October 2005, A/RES/60/1, [@:] http://www.refworld.org/docid/44168a910.html.

4. In May 2018, the Cittaslow network in Poland was composed of 28 towns: Reszel, Biskupiec, Bisztynek, Lidzbark Warmiński, Nowe Miasto Lubawskie, Lubawa, Olsztynek, Ryn, Barczewo, Gołdap, Dobre Miasto, Górowo Iławeckie, Nidzica, Pasym, Bartoszyce, Działdowo, Lidzbark, Orneta, Jeziorany, Sępopol (warmińsko-mazurskie, 20 towns in total), Murowana Goślina (wielkopolskie), Kalety (śląskie), Rejowiec Fabryczny (lubelskie), Nowy Dwór Gdański (pomorskie), Prudnik, Głubczyce (opolskie), Sianów (zachodniopomorskie), and Rzgów (łódzkie).

5. In 2006, the first Polish towns joined the initiative of Cittaslow, which is why this is the year when the implementation of this concept began in Poland.

possible to scrutinize the situation in particular areas and detect mutual relationships. However, the procedure is rather complex as it comprises several steps, which will be described in greater detail below.

What is fundamental for the reliability of the achieved results is the selection of diagnostic variables (partial factors). These must fulfill the formal and statistical requirements, but above all they have to pertain to the subject of the analysis.[6] Variables submitted to the final analysis should be distinguished by: general approval, measurability, accessibility of numerical data, relatively high quality and very strong connection to the subject (Zeliaś 2000, 36–37). Another attribute of the variables proposed in this study was their realness, which in turn arose from the data being made relative to the population size and from the inclusion of their importance expressed as a percent contribution of each phenomenon. This approach enabled us to exclude the impact of the size of a town, measured by the size of its population or in other absolute numbers, on generated values of the diagnostic variables (and consequently, on the subsequent classification of towns). Due to the lack of such efforts, one might suspect an erroneous classification or falsified results, because it would be more likely for larger towns to occupy higher positions in the rankings to be created. Thus, the empirical research only included those data which fulfilled the requirements established in connection with the formal and statistical criteria. The following were treated as necessary conditions (Malina 2004, 95):

- completeness of data in the entire analyzed time series[7]
- sufficient spatial variability measured with the variability coefficient ($V_j > 10\%$)[8]
- absence of excessive mutual correlation of variables[9]

Having chosen the diagnostic properties, the subsequent stage of the study was undertaken, which consisted of notarization. Unitarization (next to standardization and normalization) is one of the normalizing formulas which bring variables to a certain range (to a state of comparability), while removing units of measure. This procedure helps us to avoid situations in which variables with high absolute values (by an order of magnitude compared to other variables) would have a decisive contribution to the construction of the synthetic indicator of the standard of living. This would mean, in other words, that the results of classification might be distorted by these variables, by accentuating their impact relative to the others. Unitarization allows us — in comparison with standardization — to avoid a situation where the final results of the synthetic indicator calculations would be excessively affected by extreme values of some variables. Unlike standardization, unitarization lets us eliminate such situations, as it brings all data down to an interval from 0 to 1, both left- and right-bounded (Nardo et al. 2005, 18).

This stage enabled us to transform variables (often expressed in different units) to a state of comparability (in our case, to express them in a range from 0 to 1), using the following formula:

$$z_{ij} = \frac{x_{ij} - \min_i x_{ij}}{\max_i x_{ij} - \min_i x_{ij}}, \tag{1}$$

where:

z_{ij} — unitarized value of the j-th variable for the i-th object,

x_{ij} — value of the j-th variable for the i-th object.

6. High subject-matter value of diagnostic variables can be achieved primarily through an in-depth analysis of the literature, which connects both theoretical and empirical aspects (based on an analysis of proposals made by other researchers engaged in this field).

7. An exception in this regard was the value of the variable describing the number of people participating in entertainment events per 1 000 population in the first year of our analysis (2006), The reason was the lack of such data in the Local Data Bank. Consequently, the same data but from the year 2007 were included. As the final results showed, this did not cause any significant changes in the hierarchy of individual towns.

8. Variables characterized by a slightly lower variability coefficient than indicated are regarded in the literature as relatively stable and not contributing significant information about the analyzed phenomenon, or not possessing discriminating abilities (Zeliaś 2000, 127).

9. The occurrence of strongly correlated traits in the set of diagnostic variables means that such characteristics assign greater importance to the data which are replicated in the performed analysis (similar information is entered into the analysis via correlated variables). This may lead to a situation where the taxonomic analysis will yield an unreliable description of the analyzed reality due to the excessive weight of excessively correlated variables.

Having evaluated the character of each of the variables included in the research (which meant that they were identified as stimulants[10] or destimulants[11]), the destimulants had to be submitted to the process of stimulation, so as to ensure that the direction of impact for all the variables was the same, and that higher values of the synthetic measure represented a higher standard of living. To this end, the following stimulation formula was employed:

$$x_{ij} = a - bx_{ij}^{D}, \tag{2}$$

where:
j — denotes variable,
i — denotes research object (town),
a, b — arbitrary constants (here: $b = 1,\ a = \max_i x_{ij}^{D}$),
x_{ij}^{D} — value of the j-th destimulant in the i-th object (Walesiak 2006, 18).

The consecutive step in our analysis (in step with Hellwig's development pattern method) consisted of the derivation of coordinates of the pattern composed of the most advantageous values scored by the individual variables in individual towns in Poland:

$$z_{0j} = \begin{cases} \max_i z_{ij} & \text{for } z_j^S \\ \min_i z_{ij} & \text{for } z_j^D \end{cases}. \tag{3}$$

Afterwards, distances were calculated between individual towns and the pattern, using the Euclidean metric in the following form:

$$d_{i0} = \sqrt{\sum_{j=1}^{m}(z_{ij} - z_{0j})^2}, \tag{4}$$

where:
d_{i0} — distance of the object to the pattern,
z_{ij} — value of normalized variable j for the i-th of this object,
z_{0j} — coordinates of the pattern object for the j-th variable (Panek 2009, 69).

The penultimate step in the research was to determine the value of the synthetic indicator, which then served to arrange the towns with respect to the standard of living of their inhabitants. The calculations were based on the following formulas:

$$s_i = 1 - \frac{d_{i0}}{d_0}, \quad d_0 = \bar{d}_0 + 2S(d_0), \quad \bar{d}_0 = \frac{1}{n}\sum_{i=1}^{n} d_{i0}, \quad S(d_0) = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(d_{i0} - \bar{d}_0)^2}, \tag{5}$$

where:
s_i — synthetic measure of development,
d_{i0} — distance of the object from the pattern,
$\bar{d}_0$ — arithmetic mean d_0,
$S(d_0)$ — standard deviation d_0 (Panek 2009, 69).

The final stage was to determine similarities in the standard of living of the people in the analyzed territorial units (towns). The towns were grouped with the help of classification methods, where the aim is to distinguish clusters of objects most homogeneous with respect to the similarity in terms of the structure of individual observations.[12] The identified groups of objects should be strongly differentiated between the groups but as homogeneous within them as possible (Młodak 2006, 66).

Eventually, the technique chosen to achieve a hierarchy of agglomerations[13] was the one suggested in Ward's method, where the starting point is the number of clusters equal to the number

10. Diagnostic variables whose increase in the analyzed time period inform us about the positive influence on the described phenomenon. In this case, variables counted as stimulants informed us about some improvement in the standard of living of the town residents.

11. Diagnostic variables whose increase informs us about an adverse effect on the analyzed phenomenon. In this case, an increase in the value of any of the variables counted as destimulants (inhibitors) proved that the standard of living decreased. It needs to be added that there are also nominants, whose evaluation is ambiguous (variables which in a certain range of values are classified as stimulants and in others can be seen as destimulants).

12. In our case, they were synthetic indicators of the standard of living.

13. Within hierarchical clustering methods, division methods are distinguished.

of objects of a study. The criterion applied to group units into higher-order clusters (groups) is the minimum differentiation in the values of the traits (Stanisz 2007, 122) that serve as criteria for the segmentation regarding the values of the clusters created at the consecutive steps.[14] As a result, objects included in particular groups are characterized by the highest possible similarity with respect to the analyzed traits. In turn, the subsequent iterations are defined by the distance (dip) between a newly created cluster and the remaining ones, derived from the following formula:

$$d_{ip} = \frac{n_i + n_k}{n_i + n_j + n_k} d_{ik} + \frac{n_j + n_k}{n_i + n_j + n_k} d_{jk} - \frac{n_k}{n_i + n_j + n_k} d_{ij}, \tag{6}$$

where:

n_i — number of items in cluster i,
n_j — number of items in cluster j,
n_k — number of items in cluster k,
d_{ik} — distance from the original cluster i to cluster k,
d_{jk} — distance from the original cluster j to cluster k,
d_{ij} — distance between the original clusters i and j (Balicki 2009, 278).

Ward's method is widely accepted owing to its theoretical properties and satisfying results of simulation studies,[15] and through its application it is possible to achieve excellent results of clustering, where clusters are very homogeneous. Another advantage of the method is the clarity of presentation, where dendrograms are drawn.[16]

2 Selection of diagnostic variables

When undertaking the task of creating a synthetic measure of development that would describe the spatial differentiation in the standard of living, first we needed to selected diagnostic traits, which was the purpose of the taxonomic stage of the research. Worth emphasizing is the subjectivity of this step, as the researcher is required to design such a range of characteristics that would best represent the analyzed phenomenon. Our choice of diagnostic variables to calculate the synthetic measure of development was therefore based on considerations connected with the subject matter and on the formal and statistic aspects of the research object. The selected variables were characterized by the following properties (Zeliaś 2000, 37–38): they were commonly approved, relevant for the subject matter, measurable, supported by available numerical data, relatively high in quality and were derived from a thorough review of the literature. The variables were transformed relative to the populations of towns so as to reduce the influence of the size of a given town on the achieved values of the variables.

The research sample consisted of statistical data connected with the standard of living in 28 Polish towns associated in the Cittaslow network. The parameters chosen for the study are measurable and reliable because they were found in the official publications issued by the Central Statistical Office of Poland. A comparative analysis was made for the years 2006 and 2016, which was dictated by the completeness of data from these years.

The variables included in our research pertain to many fields of life (e.g., demography, housing, labor market, social and cultural infrastructure, and environmental protection). Some of the variables were eliminated at the early selection stage, mostly because of the incompleteness of data and, less often, because the aggregation of data on this level of the administrative division was impossible due to some organizational and formal obstacles.

14. See: Identyfikacja czynników ryzyka — metody klasyfikacji oraz modele zależności. Zimowe Warsztaty Analityczne SPSS (materiały szkoleniowe) by M. Rószkiewicz, Warszawa 2010, page 6.

15. By completing a series of simulations, Grabiński and Sokołowski (1980) proved that the effectiveness of finding the true structure of data with this method is by around 40% higher than obtained with the second most common method, the one of the farthest neighbor clustering.

16. A dendrogram is a tree-shaped diagram showing connections between analyzed objects based on the adopted criteria. In Ward's method, a dendrogram shows subsequent steps (iterations) in the clustering process — from leaves (single towns) to the root (one cluster).

The subsequent stage was to conduct formal and statistical tests, whose aim was to eliminate variables which were poorly ($V < 10\%$) differentiated spatially or excessively correlated ($r > 80\%$) with one another. Excessive correlation of variables is associated with the risk of replicating the same information about the analyzed object (two of them were excluded). This stage yielded the final set of variables (starting from 14 at the beginning) applied to describe the spatial differentiation in the standard of living between the towns included in the Cittaslow network in Poland, based on the variables presented in table 1.

Tab. 1. Diagnostic variables (and their character) included in the synthetic indicator of the standard of living

Variable	Character
Total migration balance (per 1 000 residents)	S
Demographic burden (in %)	D
Share of registered unemployed in total working age population (in %)	D
Average usable floor space in a home per person (in m^2)	S
Revenue per capita (in PLN)	S
Business entities registered in the REGON system (per 10 000 residents)	S
Residents in households connected to wastewater treatment facilities (in % of population)	S
Number of participants of events (per 1 000 residents)	S
Population per 1 library	D

Note: S—stimulant; D—destimulant

The author's first reflection, after analyzing partial diagnostic variables (with few exceptions), was that there had been a steady increase in the values of parameters which stimulate the standard of living, while the variables which depress it had been steadily decreasing. Most towns noted changes in the demographic burden indicator (an indicator that tells us about the number of non-working age persons per 100 working age persons), lowered the number of working age unemployed persons, and provided their inhabitants with higher quality housing.

Likewise, there was also a rise in the parameters which describe participation in cultural life, classified among higher order needs.[17] It is highlighted, too, that higher order needs gain importance along with the socio-economic growth of a society. At the onset of state transformation in Poland, Bywalec (1991, 49) claimed, quoting the experience of developed countries, that in the long run the development of social infrastructure and increase in the consumption of non-material goods would become the main driving force behind the economic growth.

3 Taxonomic analysis of the spatial differentiation of the standard of living

An outcome of the multidimensional comparative analysis reported herein was the calculation of the synthetic indicator of the standard of living in each of the 28 Polish towns involved in the idea of Cittaslow (fig. 1). The taxonomic analysis was conducted for the years 2006 and 2016, and the purpose was to compare changes in the standard of living over that time period. This approach enabled the author to classify towns into groups where the above synthetic indicator scored similar values. The final results are collated in table 2.

Just as in our analysis of partial indicators, worth noticing is an increase in the standard of living of the inhabitants in the analyzed towns, expressed by a higher value of the synthetic indicator. The highest value of this indicator was achieved in 2016 in Rzgów, where it reached 0,563, rising from 0,483 noted in 2006.[18] Hence, the highest standard of living over the analyzed decade was

17. The UN Committee of Experts defined the standard of living as "the whole entity of real living conditions of people, and the degree of their material and cultural need satisfaction by a stream of goods and paid services, as well as ones provided by social funds," which implicates that basic needs (food, housing, clothes, etc.) and higher-order needs (including culture) should be analyzed as measures of the standard of living (*Report on International…* 1954).

18. [In the journal European practice of number notation is followed—for example, 36 333,33 (European style) = 36 333.33 (Canadian style) = 36,333.33 (US and British style).—Ed.]

obtained by the residents of Rzgów in the Łódzkie Voivodship. The lowest was observed in Kalety in 2006 (0,053) and Nidzica in 2016 (0,085). Both towns experienced the highest shifts in the ranking of towns according to the standard of living over the analyzed ten-year-long period (in different directions). At the end of it, however, Kalety managed to make an impressive improvement, moving up from the last to the ninth position. Nevertheless, both the first and the last values scored in the

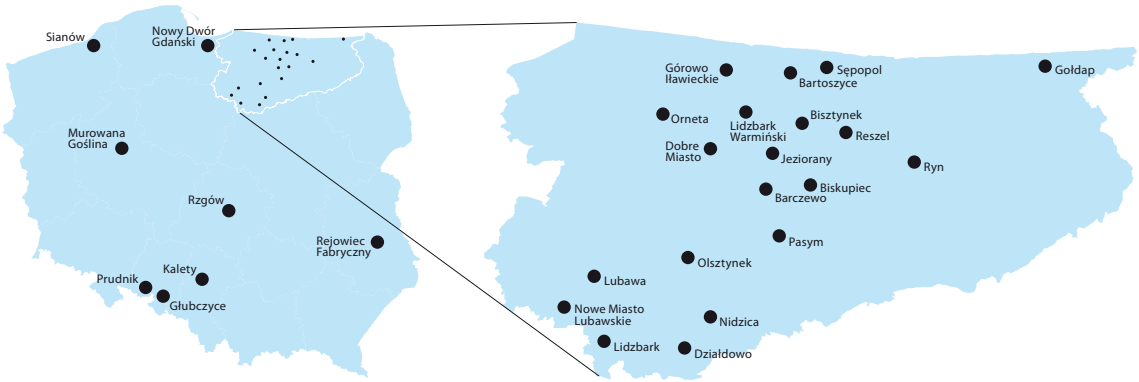

Fig. 1. Polish towns in Cittaslow in Poland and in Warmińsko-Mazurskie Voivodship

Source: Own elaboration based on map published at https://cittaslowpolska.pl/index.php/pl/o-cittaslow

Tab. 2. Ranking of towns based on the synthetic measure of the standard of living in 2016 and 2006

Town	Voivodship	Ranking 2016	Ranking 2006	Value of the indicator 2016	Value of the indicator 2006
Rzgów	Łódzkie	1	1	0,563	0,483
Ryn	Warmińsko-Mazurskie	2	9	0,415	0,235
Murowana Goślina	Wielkopolskie	3	2	0,361	0,476
Pasym	Warmińsko-Mazurskie	4	3	0,340	0,341
Olsztynek	Warmińsko-Mazurskie	5	4	0,321	0,339
Górowo Iławeckie	Warmińsko-Mazurskie	6	23	0,265	0,120
Sianów	Zachodniopomorskie	7	10	0,265	0,234
Lubawa	Warmińsko-Mazurskie	8	14	0,252	0,208
Kalety	Śląskie	9	28	0,246	0,053
Reszel	Warmińsko-Mazurskie	10	17	0,232	0,173
Nowe Miasto Lubawskie	Warmińsko-Mazurskie	11	25	0,231	0,093
Biskupiec	Warmińsko-Mazurskie	12	5	0,230	0,292
Gołdap	Warmińsko-Mazurskie	13	26	0,211	0,088
Barczewo	Warmińsko-Mazurskie	14	8	0,210	0,242
Bisztynek	Warmińsko-Mazurskie	15	11	0,191	0,231
Nowy Dwór Gdański	Pomorskie	16	18	0,190	0,157
Sępopol	Warmińsko-Mazurskie	17	12	0,167	0,222
Jeziorany	Warmińsko-Mazurskie	18	19	0,151	0,156
Dobre Miasto	Warmińsko-Mazurskie	19	24	0,148	0,114
Działdowo	Warmińsko-Mazurskie	20	7	0,147	0,256
Lidzbark	Warmińsko-Mazurskie	21	15	0,146	0,194
Rejowiec Fabryczny	Lubelskie	22	27	0,122	0,071
Głubczyce	Opolskie	23	13	0,113	0,212
Lidzbark Warmiński	Warmińsko-Mazurskie	24	16	0,109	0,174
Orneta	Warmińsko-Mazurskie	25	21	0,108	0,139
Bartoszyce	Warmińsko-Mazurskie	26	20	0,106	0,149
Prudnik	Opolskie	27	22	0,098	0,138
Nidzica	Warmińsko-Mazurskie	28	6	0,085	0,272

year 2016 were higher than noted in the first year of the analysis, 2006. This is the evidence supporting the claim of general progress in living standards, which is obviously a positive development.

It seems interesting to refer the values of the synthetic measure of living standards in the 28 towns analyzed to the scores obtained for entire voivodships. For years it has been documented that the lowest places in hierarchy of Polish voivodships with respect to the standard of living are occupied by those located in the east of Poland (i.e., Podlaskie, Podkarpackie, Lubelskie, and — above all — Świętokrzyskie and Warmińsko-Mazurskie). To a certain extent, this can explain the high position attained by Rzgów because the Łódzkie Voivodship, where Rzgów lies, was characterized by a higher standard of living than in any of the voivodships mentioned above (Janusz 2018, 153–180).[19]

Meanwhile, it is worth noticing that towns shift places in both years. Several deserve to be distinguished (Rzgów, Murowana Goślina, Pasym, Olsztynek) as those whose position in the above ranking is stable and high. It seems that they owe it to the comprehensive socio-economic growth achieved over the analyzed decade. Among the other towns, it is possible to observe relatively many shifts, which may suggest that changes are ambiguous and unstable. Most towns, however, note shifts by five or more places.

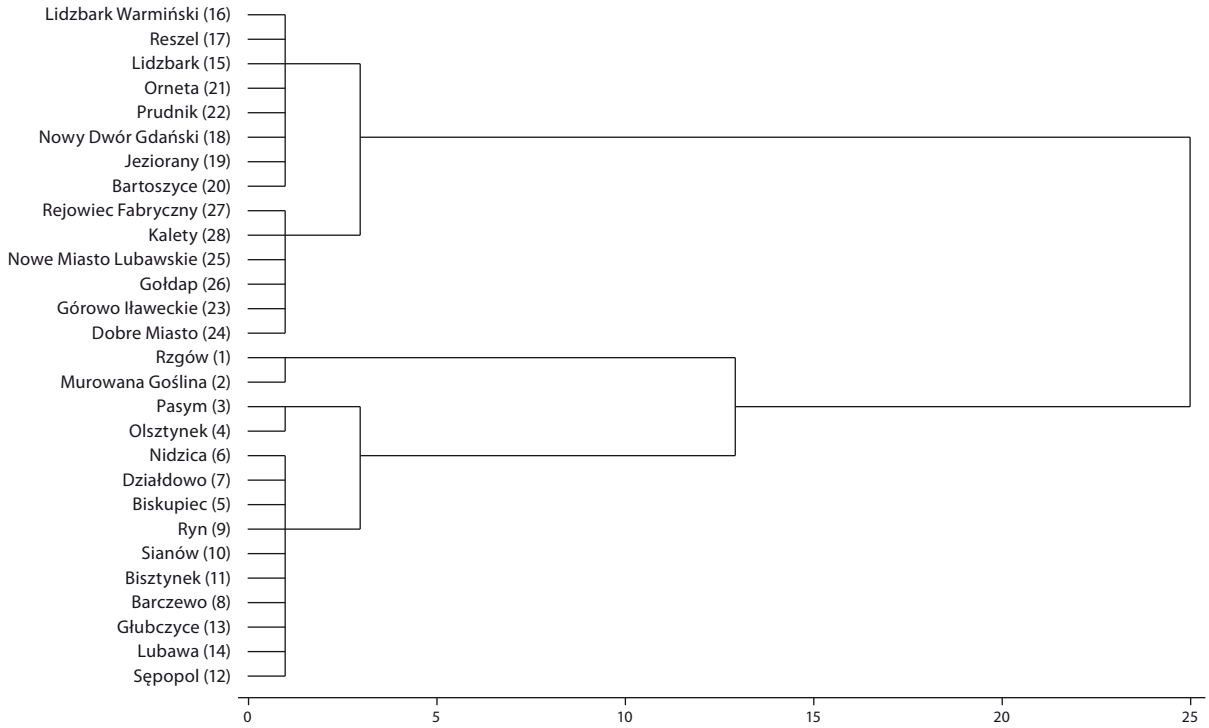

Fig. 2. Dendrogram of similarity of the standard of living (dendrogram based on Ward's connections: scaled distances; ranking 2006 in the brackets) among towns implementing the concept of Cittaslow in 2006

In order to verify the homogeneity of the standard of living and to distinguish the towns where it is relatively the greatest, similarity dendrograms were used. Their analysis provided interesting insights. Five major clusters could be distinguished in 2006 (fig. 2). A separate cluster with high values of the synthetic index was composed of Rzgów and Murowana Goślina. Only at a later stage did this cluster merge with two other ones, one having Pasym and Olsztynek in it, and another, larger one, with similar standards of living recorded in Nidzica, Działdowo, Biskupiec, Ryn, Sianów, Bisztynek, Barczew, Głubczyce, Lubawa, and Sępopol.

In both of these clusters, the standard of living exceeded the average. In the remaining 14 towns, it was below the average. The lowest was determined to be in Lidzbark, Lidzbark Warmiński,

19. Nevertheless, it must be remembered that towns from the Warmińsko-Mazurskie Voivodship are the most numerous in the Polish Cittaslow network (as many as 20 in 2018). The idea of Cittaslow stands contrary to the perception of living conditions in the quantitative context, regarded as the only measure applicable to test the well-being of residents.

Reszel, Nowy Dwór Gdański, Jeziorany, Bartoszyce, Orneta, and Prudnik. The lowest, with the highest similarity, was observed in Górowo Iławeckie, Górowo Iławeckie, Dobre Miasto, Nowe Miasto Lubawskie, Gołdap, Rejowiec Fabryczny, and Kalety. The inhabitants of these towns relatively most often faced long-lasting and complicated problems, which demand prolonged and sustained efforts to overcome.

The similarities in the standards living evidenced in 2016 testify to the erosion of the homogeneity of this characteristic within the groups of towns described above. At that time, four main clusters could be seen (fig. 3), with the first two possessing only five towns. A separate cluster, with the highest level of living, was again composed of the town Rzgów. Relatively the most similar standards were observed in the towns: Ryn, Murowana Goślina, Pasym, and Olsztynek. All the towns mentioned were characterized by a level of living above the average. The other clusters made up 82% of all the towns in Poland engaged in the Cittaslow concept, but their division was ambiguous. The third cluster contained 11 towns, whereas the fourth one, characterized by the lowest level of living, was composed of 12 towns.

While it was possible to notice the increasing similarity among the towns occupying middle positions of the ranking, a higher standard of living among the same towns located at the top of the ranking seems to be permanent. In extreme cases, the differences between the towns were as high as seven-fold, which implies strong, spatial dispersion of this phenomenon.

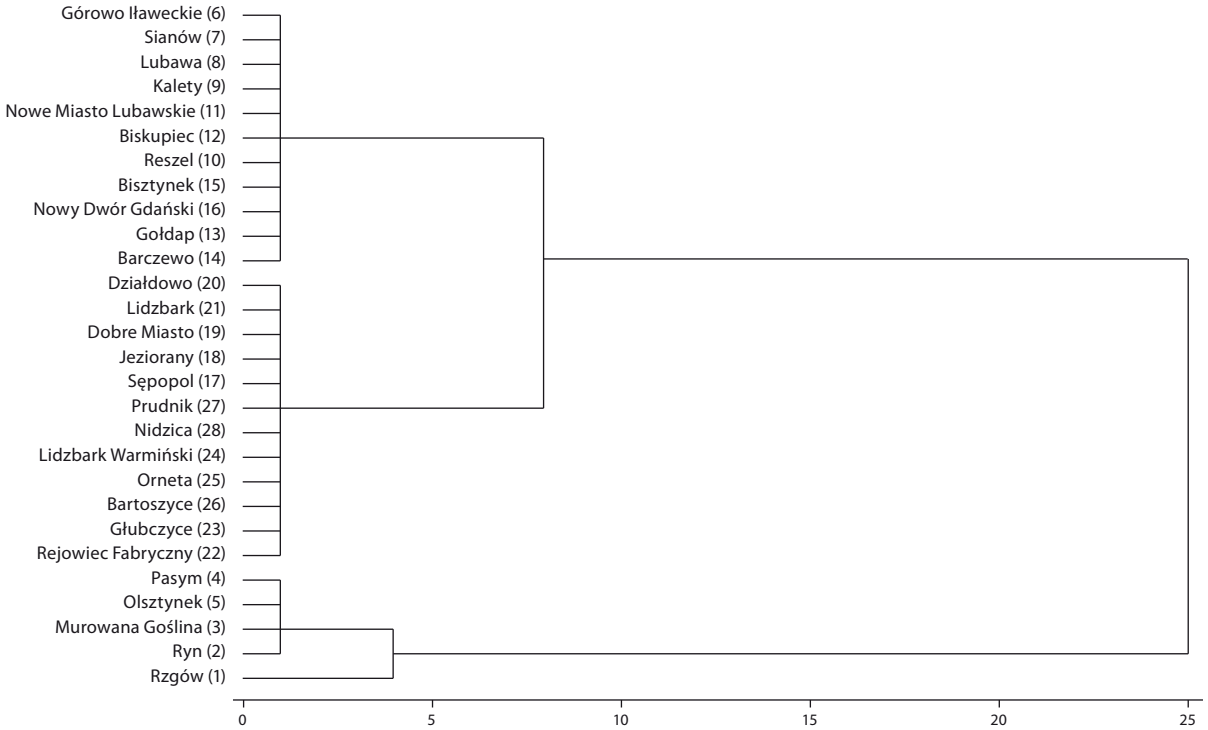

Fig. 3. Dendrogram of similarities in the standard of living (dendrogram based on Ward's connections: scaled distances; ranking 2016 in the brackets) of residents implementing the idea of Cittaslow in 2016

Summary and conclusions

It should be highlighted that the standard of living is not a homogeneous category. Differentiation mostly arises from the specific characteristics of a given region and its structure, and predominantly from its social and economic situation. Hence, the purpose of the analysis reported in this paper has been to uncover differences between the Polish towns included in the Cittaslow network and any changes in this parameter that have occurred since they joined this organization.[20] The latter

20. The idea of Cittaslow is gaining an evergrowing interest and therefore it can be expected that similar initiatives will develop in the future (see: Farelnik, Stanowicka-Traczyk, and Brodowicz-Transue 2016; Grzelak-Kostulska, Hołowiecka, and Kwiatkowski 2011; Matta and Caballero 2016).

substantiates our choice of the two years to undergo analysis: 2006 and 2016. The standard of living was assessed from the point of view of demography, social and economic aspects, and the environment. To this aim, a taxonomic method was employed. In addition, during a further stage of the analytical procedure, towns were classified into clusters by taking into account calculated values of the synthetic indicator of the standard of living and mutual similarities.

The application of a multi-dimensional analytical approach enabled the author to arrange the towns in positions from the most to the least developed. Our analysis demonstrated a distance dividing the standard of living in Rzgów, Murowana Goślina, Olsztynek, and Pasym from that in the other towns. Excluding the above towns, it was noted that the others underwent some rotations on the hierarchical lists within the analyzed sample. Similar levels of living were observed among towns with relatively average values of the synthetic parameter. The authorities of the towns with the relatively highest standards of living are able to focus on economic development, inclusive of the quality aspects. This will be possible owing to a relatively good supply of the needs that have a quantitative character. It can therefore be concluded that a successful implementation of the ideas underlying the slow city concept should improve the general well-being of the town inhabitants. In the other cases, the further development of these towns should also aim at the betterment of qualitative features.

Let us not forget that the results of clustering analyses can be debatable and should be treated as such. To a large extent, the reason is the difficult selection of indicators appropriate for a given analysis, which in taxonomic methods is invariably be burdened by the author's subjective assessment. The literature dealing with this subject emphasizes that a study of the same phenomenon carried out on another set of diagnostic features could bring different results. Nevertheless, being able to diagnose differences in the level of living set on a regional scale and to identify the main characteristics and destimulants are extremely important for regional policy (cohesion policy), whose aim is to level off differences and to support the efficient development of municipalities, districts, voivodships and the entire country.

References

Balicki, A. 2009. *Statystyczna analiza wielowymiarowa i jej zastosowania społeczno-ekonomiczne*. Gdańsk-Sopot: Wydawnictwo Uniwersytetu Gdańskiego.

Bekar, A., N. Yozukmaz, Ç. Sürücü, and A.M. Gövce. 2015. "The Concept of Cittaslow as a Marketing Tool for Destination Development: The Case of Mugla, Turkey." *American International Journal of Social Science* 4 (3): 54–64.

Berbeka, J. 2006. *Poziom życia ludności a wzrost gospodarczy w krajach Unii Europejskiej*. Zeszyty Naukowe / Akademia Ekonomiczna w Krakowie Seria Specjalna, Monografie,. Kraków: Wydawnictwo Akademii Ekonomicznej.

Biernacki, M. 2006. "Kilka uwag o pomiarze dobrobytu społecznego." *Mathematical Economics* (3): 115–124.

Bywalec, C. 1991. *Wzrost gospodarczy a poziom życia społeczeństwa polskiego*. Monografie i Syntezy / Instytut Rynku Wewnętrznego i Konsumpcji. Warszawa: IRWiK.

———. 2010. *Konsumpcja a rozwój gospodarczy i społeczny*. Ekonomia. Warszawa: Wydawnictwo C.H. Beck.

Cobb, C., T. Halstead, and J. Rowe. 1995. "If the GDP is Up, Why is America Down?" *The Atlantic Monthly*, October 1995.

Czapiński, J. 2012. "Ekonomia szczęścia i psychologia bogactwa." *Nauka (Wrocław)* (1): 51–88.

Drabsch, T. 2012. "Measuring Wellbeing." *NSW Parliamentary Research Service Briefing Paper* (4): 1–53.

Easterlin, R.A. 1974. "Does Economic Growth Improve the Human Lot? Some Empirical Evidence." In *Nations and Households in Economic Growth: Essays in Honor of Moses Abramovitz*, edited by P.A. David and M.W. Reder, 89–126. New York: Academic Press.

———. 1995. "Will Raising the Incomes of All Increase the Happiness of All." *Journal of Economic Behavior & Organization* 27 (1): 35–47. doi: 10.1016/0167-2681(95)00003-B.

Farelnik, E., A. Stanowicka-Traczyk, and A. Brodowicz-Transue. 2016. "Smart City, Slow City and Smart Slow City as Development Models of Modern Cities." *Olsztyn Economic Journal* 11 (4): 359–370.

Farelnik, E., A. Stanowicka, and W. Wierzbicka. 2017. "International Cooperation between Cities Based on The Example of the Cittaslow Network." *Olsztyn Economic Journal* 12 (4): 415–425.

Frey, B.S., and A. Stutzer. 2002. *Happiness and Economics. How the Economy and Institutions Affect Well-Being*. Princeton, N.J.: Princeton University Press.

Gadrey, J., and F. Jany-Catrice. 2006. *The New Indicators of Well-Being and Development*. Basingstoke England – New York: Palgrave Macmillan.

Grabiński, T., and A. Sokołowski. 1980. "The Effectiveness of Some Signal Identification Procedures." In *Signal Processing, Theories and Applications. Proceedings of EUSIPCO-80, First European Signal Processing Conference, Lausanne, Switzerland, September 16–18, 1980*, edited by M. Kunt and F.d.r.d. Coulon, 617–623. Amsterdam – New York: North-Holland Pub. Co.

Grzelak-Kostulska, E., B. Hołowiecka, and G. Kwiatkowski. 2011. "Cittaslow International Network: an Example of a Globalization Idea?" In *The Scale of Globalization: Think Globally, Act Locally, Change Individually in the 21st Century*, edited by T. Drobík, 186–192. Ostrava: University of Ostrava.

Hellwig, Z. 1968. "Zastosowanie metody taksonomicznej do typologicznego podziału krajów ze względu na poziom ich rozwoju oraz zasoby i strukturę wykwalifikowanych kadr." *Przegląd Statystyczny* (4): 302–327.

Janusz, M. 2018. *Sytuacja mieszkaniowa w Polsce jako wyznacznik dysproporcji poziomu życia*. doctoral thesis, Wydział Nauk Ekonomicznych, UWM w Olsztynie, Olsztyn.

Li, Y., and H.W. Li. 2015. "The Slow City Concept and its Inspiration for Local Culture Protection in Domestic Urbanization Process." *Advanced Materials Research* 1079–1080 (1079): 1286–1289. doi: 10.4028/www.scientific.net/AMR.1079-1080.1286.

Lowry, L.L., and M. Lee. 2011. CittaSlow, Slow Cities, Slow Food: Searching for a Model for the Development of Slow Tourism. Paper read at 2011 ttra International Conference, 2011.06.19–21, at London, Ontario, Canada.

Machowska-Okrój, S. 2014. "Wzrost gospodarczy a dobrobyt ekonomiczno-społeczny w wybranych krajach europejskich." In *Problemy współczesnej ekonomii. Tom 2*, edited by T. Bernat and D. Kopycińska, 409–430. Szczecin: Wydawnictwo Naukowe Uniwersytetu Szczecińskiego.

Malina, A. 2004. *Wielowymiarowa analiza przestrzennego zróżnicowania struktury gospodarki Polski według województw*. Zeszyty Naukowe / Akademia Ekonomiczna w Krakowie Seria Specjalna, Monografie. Kraków: Wydawnictwo AE.

Matta, E., and G. Caballero. 2016. *Possible Implementation of Cittaslow to Urban Centres of the World*. International Federation of Landscape Architects, last updated April 2016 [accessed 2018.11.05]. Available from http://iflaonline.org/2016/04/possible-implementation-of-cittaslow-to-urban-centres-of-the-world/.

Mayer, H., and P.L. Knox. 2006. "Slow Cities: Sustainable Places in a Fast World." *Journal of Urban Affairs* 28 (4): 321–334. doi: 10.1111/j.1467-9906.2006.00298.x.

Młodak, A. 2006. *Analiza taksonomiczna w statystyce regionalnej*. Warszawa: Centrum Doradztwa i Informacji Difin.

Nardo, M., M. Saisana, A. Saltelli, S. Tarantola, A. Hoffman, and E. Giovannini. 2005. "Handbook on Constructing Composite Indicators. Methodology and User Guide." *OECD Statistics Working Papers* (2005/03): 1–109. doi: 10.1787/533411815016.

Panek, T. 2009. *Statystyczne metody wielowymiarowej analizy porównawczej*. Warszawa: Szkoła Główna Handlowa. Oficyna Wydawnicza.

Report on International Definition and Measurement of Standards and Levels of Living. 1954. United Nations Document E/CN 3/179, E/CN 5/299. New York: United Nations, Committee of Experts on International Definition and Measurement of Standards and Levels of Living.

Ryszkiewicz, A. 2013. *Od konwergencji do spójności i efektywności. Podstawy teoretyczne polityki spójności gospodarczej, społecznej i terytorialnej Unii Europejskiej*. Warszawa: Szkoła Główna Handlowa, Oficyna Wydawnicza.

Stanisz, A. 2007. *Przystępny kurs statystyki z zastosowaniem Statistica PL na przykładach z medycyny. T. 3. Analizy wielowymiarowe*. Kraków: StatSoft Polska.

Stiglitz, J., A.K. Sen, and J.-P. Fitoussi. 2009. The Measurement of Economic Performance and Social Progress Revisited. Reflections and Overview. *Document de travail de 'OFCE* (2009–33), http://spire.sciencespo.fr/hdl:/2441/5l6uh8ogmqildh09h4687h53k/resources/wp2009-33.pdf.

Śleszyńska-Świderska, A. 2017. "Dobrobyt społeczno-ekonomiczny w krajach UE w warunkach pokryzysowych." *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu* (489): 427–437.

Turek, M. 2013. "Współczesne makroekonomiczne problemy pomiaru dobrobytu." In *Oblicza dobrobytu. Perspektywa nauk ekonomicznych*, edited by W. Łysiak-Szydłowska and K. Strzała, 9–21. Kwidzyn: Powiślańska Szkoła Wyższa.

Walesiak, M. 2006. *Uogólniona miara odległości w statystycznej analizie wielowymiarowej*. 2nd ed. Wrocław: Wydawnictwo Akademii Ekonomicznej im. Oskara Langego.

Zeliaś, A. ed. 2000. *Taksonomiczna analiza przestrzennego zróżnicowania poziomu życia w Polsce w ujęciu dynamicznym*. Kraków: Wydawnictwo Akademii Ekonomicznej.