

# An Analysis of Chosen Aspects of Regional Potentials of Housing Economy with Particular Focus on Social and Economic Dimension

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## Abstract

*This article presents factors which influence creation of regional housing economy potential. Such factors, according to public statistics, include heat engineering, housing benefits, renovations and modernizations, quantity and quality of web devices and status of housing resources. The author has chosen some factors, from those mentioned above, taking into consideration sustainable regional development with particular focus on social and economic dimension. In the calculative part, the author used multidimensional comparative analysis allowing for parametrization and analysis of the examined areas. Application of multidimensional comparative analysis showed potential of housing economy development in the chosen areas related to housing resources. The use of multi-criteria approach allows the simultaneous consideration of several dimensions of regional development, which allows the calculation of an integral multidimensional development index.*

**Keywords:** housing, development potential, multi-dimensional comparative analysis

## Introduction

Housing economy, as one of factors influencing on life's quality, is an important element of development strategy of each country of region. Level of housing economy development, in public statistics, is measured with application of six elements—i.e., heat engineering, housing benefits, loss in housing resources, renovations and modernizations, quantity and quality of web devices and status of housing resources. In much research referring to parametrization of development potential and in research dealing with widely understood development, the relevant aspect is an analysis of the above-mentioned research areas with consideration of sustainable (appropriate) development. For the purpose of this article sustainable development shall be understood as development of housing economy in the economic, social and environmental dimension. The basic aim conducted research is description and mono- and multidimensional analysis of changes taking place in the area of housing economy. The starting point to carry out the research was to gather existing data referring to housing economy. The data were obtained from the data base of Central Statistical Office of Poland. Following the data collection the author analyzed them and created mono- and multi-dimensional rankings presenting potential of development of regional housing economies. Due to the extensive nature of the described research area, this article focuses on the analysis of chosen determinants influencing on the status and potential of housing resources development.

## 1 Reasonable region development in respect to determinants of housing economy development

Making an attempt to regularize the concepts of regional development, i.e. investigating classical concept of development (Domański 2004; Grosse 2002; Malik 2011; Schumpeter 1934; Stackelberg and Halne 1998) and modern theories and development models (Nowińska-Łażniewska 2004;

Porter 1990; Schumpeter 1934) or concepts of development in reference to sustainable development (Borys 1999; Ekins 2000; Fiedor 1990; Malik 2011), one should always, while carrying out analyses, take into consideration the essence of such activities (i.e., multidimensionalism). Multidimensionalism which is situated in research of long-lasting and structural changes concerning social or economic phenomena. Coincidence of the above-mentioned areas should be placed in the space of territorial unit and it should concern a defined time span. In the research described in this article, a voivodship is a territorial unit, the time span ranges from 2008 to 2014 and the analysis of changes refers to housing economy with the main focus on social and economic dimension. Making an attempt to identify determinants influencing on parameterization of potential of housing economy development, the author analyzed six areas which influence such economy. These areas include: heat engineering, housing benefits, loss in housing resources, renovations and modernizations, quantity and quality of web devices and housing resources. For each out of the identified six areas of investigation, potential variables were defined, which influence creation of potential in the scope of housing economy. The identified variables will be described and explained in the part concerning presentation and analysis of the obtained results. It has to be emphasized again that the presentation of the research results and their analysis were carried out only for the selected development determinants (see section 3). The methodology of the applied calculations is based on multidimensional comparative analysis and this methodology was described by Aczel (2000) and Panek (2009). The research of regional development, as an extensive area, was described in numerous publications, among others Justyna Zygmunt (2014; 2015), Aleksandra Zygmunt (2014) and it concerned enterprise, sustainable development or fundings of research and development in reference to the aspect of the sustainable development.

## 2 Presentation and analysis of the obtained results

The first area which was the subject of the analysis are housing resources. The analysis of the housing resources was conducted from two perspectives. The first one shows statistics in general. The second one, parameterization of housing resources per unit's value. The analysis of housing resources, global and individual, served the purpose to present the housing resources in two dimensions. The dimensions, whose aim was to define appropriate economic and social developmental potential. In general, the attempt of housing resources analysis was carried out with consideration of three variables (i.e.,  $x_1$ —number of flats in general,  $x_2$ —number of rooms in general, and  $x_3$ —area of flats in general). The research was conducted for 2008 and 2014. The table 1 includes data characterizing Polish housing resources.

**Tab. 1.** Data of Polish housing resources as of the end of the years 2008 and 2014

	2008	2014
Number of flats	13 150 294	13 983 039
Number of rooms	48 703 136	53 406 414
Area of flats (m <sup>2</sup> )	923 411 289	1 025 732 290
Population	38 135 876	38 478 602

*Source:* Own study based on data published by Central Statistical Office of Poland (CSO)

[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.]

The data presented in the table 1 pinpoint that, on average, 139 000 new flats are built in Poland in each year. It worth emphasizing that such an increase is observed with little increase in population. Picture 1 presents the results of voivodship ranking with application of multidimensional comparative analysis used for three variables (i.e.,  $x_1$ ,  $x_2$ ,  $x_3$ ). These rankings present the economic potential of individual regions in 2008 and 2014. The presented rankings prove that the greatest economic potential, in the area of housing resources, characterizes mazowieckie voivodship. Second is Śląskie Voivodship. The poorest potential is observed in Lubuskie and Opolskie voivodships.

In the table 2 the author indicates the voivodship rankings. Interestingly, Mazowieckie Voivodship obtained 100 points in both years. Second, Śląskie Voivodship, obtained 84 and 76 points respectively for 2008 and 2014. This is an 8-point decrease whereas Mazowieckie Voivodship obtained the same amount of points, which indicates an increase in potential of housing resources of Mazowieckie Voivodship in relation to other voivodships.

The second area which was subject to analysis is the potential of housing resources in reference to individual characteristics. The housing resources expressed in units were parameterized with five variables (i.e.,  $x_4$ —number of rooms in 1 flat,  $x_5$ —number of people in 1 flat,  $x_6$ —number of people in one room,  $x_7$ —floorage of 1 flat, and  $x_8$ —floorage per person). In the table 3 the average values for 5 analyzed variables were presented. It can be seen in the data that an average floorage of 1 flat has increased from 70,2 square meters in 2008 to 73,4 square meters in 2014.

Figure 2 shows the results of obtained rankings for the areas of housing resources from the individual perspective with the application of  $x_4$ ,  $x_5$ ,  $x_6$ ,  $x_7$ , and  $x_8$  variables. The obtained rankings allow to assess voivodships from the perspective of social resources in relation to housing resources. Taking into consideration data relating to number of rooms in a flat, number of people in a flat, number of people per room, average floorage of one flat or floorage of one

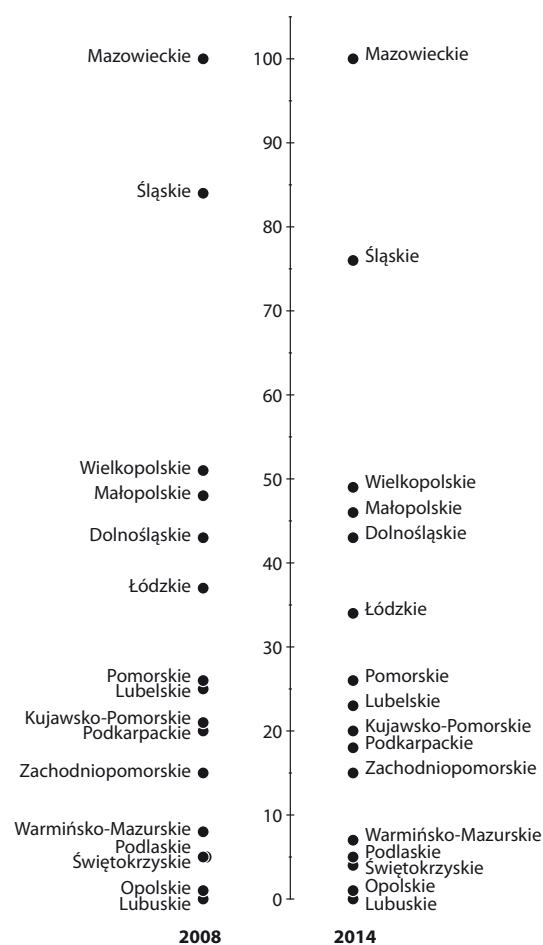


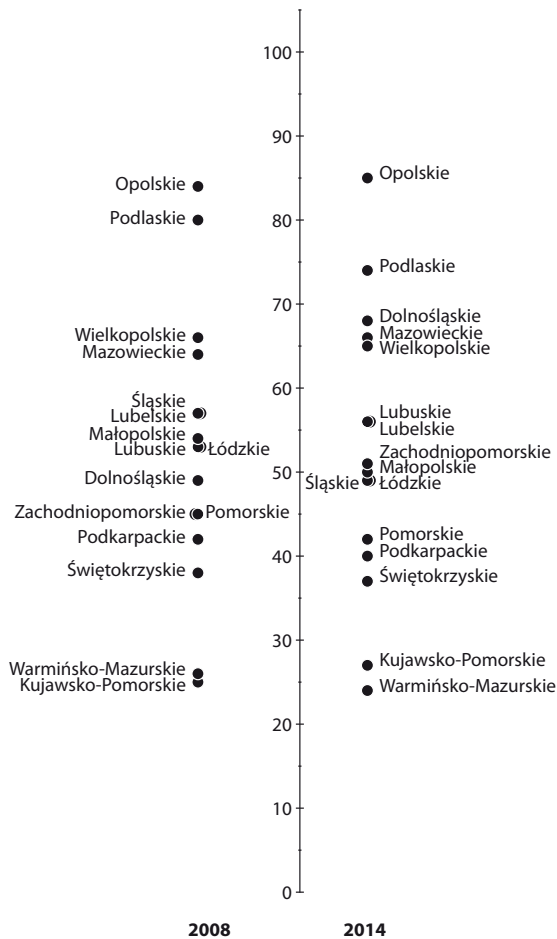
Fig. 1. Ranking of voivodships with application of variables  $x_1$ ,  $x_2$ , and  $x_3$  (years 2008 and 2014)

Tab. 2. Comparison of the ranking points of the years 2008 and 2014 (numbers in brackets—e.g., (1–1)—indicate voivodship ranking place in 2008 and 2014 respectively)

Voivodship	2008	2014	Shift
Mazowieckie (1–1) . . . . .	100	100	0
Śląskie (2–2) . . . . .	84	76	–8
Wielkopolskie (3–3) . . . . .	51	49	–2
Małopolskie (4–4) . . . . .	48	46	–2
Dolnośląskie (5–5) . . . . .	43	43	0
Łódzkie (6–6) . . . . .	37	34	–3
Pomorskie (7–7) . . . . .	26	26	0
Lubelskie (8–8) . . . . .	25	23	–2
Kujawsko-Pomorskie (9–9) . .	21	20	–1
Podkarpackie (10–10) . . . . .	20	18	–2
Zachodniopomorskie (11–11) .	15	15	0
Warmińsko-Mazurskie(12–12)	8	7	–1
Podlaskie (13–13) . . . . .	5	5	0
Świętokrzyskie (14–14) . . . . .	5	4	–1
Opolskie (15–15) . . . . .	1	1	0
Lubuskie (16–16) . . . . .	0	0	0

**Tab. 3.** The average values for 5 variables ( $x_4, x_5, x_6, x_7, x_8$ ) as of the end of the years 2008 and 2014

	2008	2014
Number of rooms in 1 flat	3,70	3,82
Number of people in 1 flat	2,90	2,75
Number of people in one room	0,78	0,72
Floorage of 1 flat	70,20	73,40
Floorage per person	24,20	26,70

**Fig. 2.** Ranking of voivodships with application of variables  $x_4, x_5, x_6, x_7, x_8$  (years 2008 and 2014)

morskie voivodships, obtaining 86, 85, and 83 ranking points respectively in 2014. Taking into consideration the amount of obtained points, Łódzkie Voivodship is surprisingly low. This voivodship obtained in this category in 2008 only 8 points, whereas in 2014 only 9 points. In the examined area, the greatest potential was shown by Lubuskie, Kujawsko-pomorskie, and Dolnośląskie voivodships. Making an attempt to explain low position of Łódzkie Voivodship, figure 3 shows column chart in percentage of variables from  $x_9$  to  $x_{13}$  average values. It is shown with linear chart values obtained by Łódzkie Voivodship. Figure indicates that Łódzkie Voivodship, in each of the examined variables, obtained values lower than an average value, especially in “gas from network” category.

Another area of investigation describing socio-economic potential is the cost of maintaining housing real-estate. In methodology of calculating the costs, which is widely accepted, it is assumed that they are the sum of exploitation costs and costs of provided services. Tables 7 and 8 present the costs of real-estate maintenance in 2008 and 2014 respectively. It can be concluded,

flat per person, it can be observed that the greatest potential have two voivodships. Analyzing year 2008 and 2014, the first place got Opolskie Voivodship and the second place got Podlaskie Voivodship. The weakest potential has Kujawsko-Pomorskie and Warmińsko-Mazurskie voivodships.

Table 4 presents ranking comparison. Over the course of 2008–2014 Opolskie Voivodship increased its social potential in the described area (an increase of ranking points by 1). It is worth noticing that ranking position of Dolnośląskie Voivodship has increased significantly. This voivodship, over the course of 2008–2014, advanced from 10th to 3rd ranking position, increasing the number of points by 19. The most significant decrease in potential is observed in Śląskie Voivodship, which dropped from the 5th to 10th position (−8 ranking points).

The third area which underwent an analysis is house equipment. House equipment was examined from the perspective of such equipment as: waterworks ( $x_9$ ), toilet ( $x_{10}$ ), bathroom ( $x_{11}$ ), gas from the network ( $x_{12}$ ) and central heating ( $x_{13}$ ). Table 5 shows percentage of house equipment in media in 2008 and 2014. The smallest percentage coverage in Poland, described in media, is in the area of gas from network (in 2014 74% of flats), whereas the best percentage has waterworks.

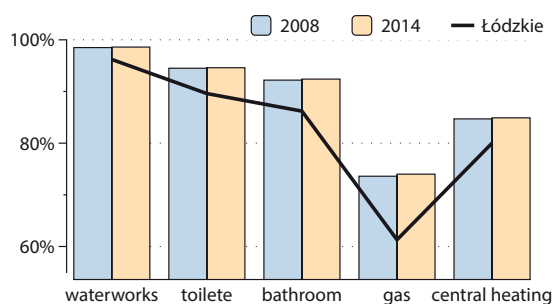
While analyzing flats equipment, table 6 served comparison of ranking calculations for the years 2008 and 2014. The greatest potential show Pomorskie, Warmińsko-Mazurskie and Zachodniopomorskie voivodships, obtaining 86, 85, and 83 ranking points respectively in 2014. Taking into consideration the amount of obtained points, Łódzkie Voivodship is surprisingly low. This voivodship obtained in this category in 2008 only 8 points, whereas in 2014 only 9 points. In the examined area, the greatest potential was shown by Lubuskie, Kujawsko-pomorskie, and Dolnośląskie voivodships. Making an attempt to explain low position of Łódzkie Voivodship, figure 3 shows column chart in percentage of variables from  $x_9$  to  $x_{13}$  average values. It is shown with linear chart values obtained by Łódzkie Voivodship. Figure indicates that Łódzkie Voivodship, in each of the examined variables, obtained values lower than an average value, especially in “gas from network” category.

**Tab. 4.** Comparison of the ranking points of the years 2008 and 2014 (numbers in brackets—e.g., (1–1)—indicate voivodship ranking place in 2008 and 2014 respectively)

Voivodship	2008	2014	Shift
Opolskie (1–1) . . . . .	84	85	1
Podlaskie (2–2) . . . . .	80	74	–6
Dolnośląskie (10–3) . . . . .	49	68	19
Mazowieckie (4–4) . . . . .	64	66	2
Wielkopolskie (3–5) . . . . .	66	65	–1
Lubuskie (8–6) . . . . .	53	56	3
Lubelskie (6–7) . . . . .	57	56	–1
Zachodniopomorskie (11–8) . . . . .	45	51	6
Małopolskie (7–9) . . . . .	54	50	–4
Śląskie (5–10) . . . . .	57	49	–8
Łódzkie (9–11) . . . . .	53	49	–4
Pomorskie (12–12) . . . . .	45	42	–3
Podkarpackie (13–13) . . . . .	42	40	–2
Świętokrzyskie (14–14) . . . . .	38	37	–1
Kujawsko-Pomorskie (16–15) . . . . .	25	27	2
Warmińsko-Mazurskie (15–16) . . . . .	26	24	–2

**Tab. 5.** Fraction (in %) of flats equipped in chosen utilities—average values for 5 variables ( $x_9$ ,  $x_{10}$ ,  $x_{11}$ ,  $x_{12}$ ,  $x_{13}$ )

	2008	2014
Waterworks	98,5	98,6
Toilet	94,5	94,6
Bathroom	92,2	92,4
Gas from the network	73,6	74,0
Central heating	84,7	84,9

**Fig. 3.** Percentage values of variables from  $x_9$  to  $x_{13}$ 

Source: Own elaboration based on data published by CSO of Poland

from the presented tables, that the lowest costs of maintenance is characteristic for municipal resources, whereas the greatest resources are characteristic for housing association. Based on the example of Dolnośląskie Voivodship one can observe that in 2008 the costs of real-estate maintenance is four times higher than in municipal resources. In 2014 this difference got even bigger reaching almost 500%. In 2008 the highest costs of maintenance were in Mazowieckie Voivodship. It is also worth noticing that over the course 2008–2014 a significant increase costs of real-estate maintenance. It is particularly visible for the resources managed by housing association. The greatest increase in maintenance costs was observed in Pomorskie Voivodship. In 2008 this cost equaled PLN 2 846 per year, whereas in 2014 it increased to PLN 10 489 per year.

**Tab. 6.** Comparison of the ranking points of the years 2008 and 2014 (numbers in brackets—e.g., (1–1)—indicate voivodship ranking place in 2008 and 2014 respectively)

Voivodship	2008	2014	Shift
Pomorskie (1–1) . . . . .	84	86	2
Warmińsko-Mazurskie (2–2) .	88	85	–3
Zachodniopomorskie (3–3) . .	81	83	2
Małopolskie (4–4) . . . . .	74	77	3
Mazowieckie (5–5) . . . . .	77	77	0
Podkarpackie (6–6) . . . . .	76	75	–1
Opolskie (7–7) . . . . .	70	72	2
Wielkopolskie (8–8) . . . . .	66	71	5
Lubuskie (11–9) . . . . .	58	67	9
Kujawsko-Pomorskie (12–10) .	56	62	6
Lubelskie (9–11) . . . . .	61	60	–1
Podlaskie (10–12) . . . . .	60	59	–1
Dolnośląskie (15–13) . . . . .	48	54	6
Świętokrzyskie (13–14) . . . . .	51	50	–1
Śląskie (14–15) . . . . .	49	48	–1
Łódzkie (16–16) . . . . .	8	9	1

**Tab. 7.** The costs of real-estate maintenance in 2008 (PLN per year)

Voivodship	Municipal resources	Housing association	Housing community
Mazowieckie . . . . .	2 095	4 585	3 451
Kujawsko-Pomorskie .	1 922	3 673	2 712
Wielkopolskie . . . . .	1 970	3 348	2 702
Małopolskie . . . . .	1 338	3 397	2 684
Łódzkie . . . . .	1 637	4 315	2 681
Śląskie . . . . .	1 875	3 920	2 645
Podkarpackie . . . . .	1 499	3 384	2 632
Pomorskie . . . . .	2 254	2 846	2 586
Zachodniopomorskie . .	1 372	2 745	2 492
Warmińsko-Mazurskie	1 007	3 839	2 474
Lubelskie . . . . .	1 312	3 165	2 472
Opolskie . . . . .	1 432	3 120	2 431
Podlaskie . . . . .	945	4 124	2 251
Świętokrzyskie . . . . .	994	3 657	2 212
Dolnośląskie . . . . .	948	4 034	1 778
Lubuskie . . . . .	1 160	3 429	1 611

Source: Own elaboration based on data published by CSO of Poland

Table 9 presents ranking suggestions for individual voivodships in 2008 and 2014 and the dynamics of changes referring to the number of the obtained ranking points. The greatest increase of potential in the area of real-estate maintenance costs were noticed in Łódzkie (increase of 24 points), Opolskie, and Podkarpackie voivodships (increase of 22 points). Among 16 examined voivodships, there are also some which experienced decrease in ranking points (e.g., Małopolskie and Śląskie voivodships).

The author presented, with further analysis of real-estate maintenance costs, in table 10 an average maintenance costs for municipal resources, housing association and housing community, costs which were noticed in 2008 and 2014. In case of every housing resource, regardless of

**Tab. 8.** The costs of real-estate maintenance in 2014 (PLN per year)

Voivodship	Municipal resources	Housing association	Housing community
Mazowieckie . . . . .	2 998	8 378	4 888
Śląskie . . . . .	2 571	8 775	4 297
Małopolskie. . . . .	1 701	8 474	4 103
Podlaskie . . . . .	1 507	7 089	4 069
Kujawsko-Pomorskie .	2 303	8 164	3 871
Łódzkie . . . . .	2 511	6 766	3 673
Wielkopolskie . . . . .	2 571	7 458	3 568
Lubelskie . . . . .	1 305	8 124	3 541
Pomorskie . . . . .	1 980	10 489	3 508
Zachodniopomorskie. .	1 453	7 843	3 493
Świętokrzyskie . . . . .	1 405	6 828	3 455
Podkarpackie . . . . .	1 512	7 240	3 384
Warmińsko-Mazurskie	1 411	7 700	3 092
Opolskie . . . . .	1 293	7 374	2 906
Lubuskie . . . . .	1 264	7 851	2 765
Dolnośląskie . . . . .	1 638	8 154	2 455

*Source:* Own elaboration based on data published by CSO of Poland

**Tab. 9.** Comparison of the ranking points of the years 2008 and 2014 (numbers in brackets—e.g. (1–1)—indicate voivodship ranking place in 2008 and 2014 respectively)

Voivodship	2008	2014	Shift
Opolskie (6–1) . . . . .	66	88	22
Lubuskie (1–2) . . . . .	82	86	4
Świętokrzyskie (4–3) . . . . .	71	83	12
Dolnośląskie (2–4) . . . . .	74	80	6
Warmińsko-Mazurskie (8–5) .	63	80	17
Podkarpackie (10–6) . . . . .	56	78	22
Zachodniopomorskie (3–7) . .	73	73	0
Lubelskie (5–8) . . . . .	67	72	5
Podlaskie (7–9) . . . . .	63	70	7
Łódzkie (15–10) . . . . .	35	59	24
Małopolskie (9–11) . . . . .	59	54	–5
Wielkopolskie (12–12) . . . . .	43	53	10
Kujawsko-Pomorskie (13–13) .	38	48	10
Pomorskie (11–14) . . . . .	47	38	–9
Śląskie (14–15) . . . . .	36	32	–4
Mazowieckie (16–16) . . . . .	4	19	15

**Tab. 10.** The costs of real-estate maintenance in 2008 and 2014 (PLN per year)

Housing resources	2008	2014
Municipal resources	1 485	1 839
Housing association	3 599	7 919
Housing community	2 488	3 567

ownership type, one can observe an increase of maintenance costs. The greatest costs were observed in housing associations.

## Summary

While analyzing chosen potentials of regional housing economy, 13 variables were identified. The defined variables were placed, described and subjected to multidimensional comparative analysis in three research areas. The first area being parametrizing housing resources, the second being houses equipment, and the third area describing real-estate maintenance costs. The analysis of the chosen areas allowed to indicate development potentials for individual voivodships, with particular focus on social and economic dimension. The use of multivariate analysis allowed to pinpoint the strong and weak sides of regional housing economy, which directly allowed to assess the chances and threats of housing branch development.

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