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SITUATION OF LABOUR MARKET IN WROCŁAW AGGLOMERATION*

1. Introduction

In the article the research conducted in Wrocław agglomeration for the years 2000-2004 is presented. There is considered the situation of jobless people in 9 Lower Silesian poviats (Polish county): Milicz, Oleśnica, Oława, Strzelin, Środa Śląska, Trzebnica, Wołów, Wrocław rural poviat and Wrocław city. Situation in these poviats is compared with situation of overall Wrocław agglomeration, Lower Silesia and Poland. The data come from Voivodship and Poviat Work Offices.

Several aspects of unemployment are considered, for example:

- unemployment and inflow of job offers in 5 years,
- jobless according to chosen categories (e.g. woman, handicapped, people with law of unemployment benefit, people living in the country),
- the registered unemployed persons according to age, to educational status, to practice of work, to time of remaining without work,
- the registered unemployed persons according to big and elementary professional group.

There are applied different statistical tools to analyse the situation on labour market, e.g. ternary graph, synthetic measure. We study dynamics, calculate fractions and empirical distributions of some features in poviats and Wrocław agglomeration. The results are presented in tables and on graphs. All calculations are made in MS Excel.

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2. Applied analysis tools

2.1. Ternary graph

The ternary graph (also known as Ossan triangle) is applied in different science disciplines. Primary application of ternary triangle is graphic presentation of percent participation of 3 categories. These participations have to sum up to unity (100%).

The point of ternary graph is received as point in three-dimensional space on the simplex surface that is in the following relation (see [2]):

$$a + b + c = 1,$$

where a, b, c are the participations of 3 categories on 3 coordinate axes. The simplex turn causes passage to two-dimension space. However, finding the coordinates of this point is very difficult.

Another way is to apply the following property of equilateral triangle: the sum of any points distance in equilateral triangle from its sides is equal to triangle's height. From this principle the coordinates of two-dimensional point (x, y) are the following (see [1]):

$$y = b, \quad (1)$$

$$x = \frac{y + 2c}{\sqrt{3}} = \frac{b + 2c}{\sqrt{3}}. \quad (2)$$

These formulas are received by using the property of equilateral triangle.

The axis scale could also be marked on the graph, for example 1/3, 1/4, 1/5, 10%, 1%, etc. The coordinates of the end of segment are received from (1) and (2) under the assumption of zero percent participant of one of three categories. In Table 1 there are presented the coordinates if the unit of scale is equal to k/m , ($k = 1, 2, \dots, m - 1$).

Table 1. The coordinates of the end of equilateral triangles segment of scale

Category A		Category B		Category C	
$x_1 = \frac{m-k}{m\sqrt{3}}$	$y_1 = \frac{m-k}{m}$	$x_1 = \frac{2m-k}{m\sqrt{3}}$	$y_1 = \frac{k}{m}$	$x_1 = \frac{m+k}{m\sqrt{3}}$	$y_1 = \frac{m-k}{m}$
$x_2 = \frac{2(m-k)}{m\sqrt{3}}$	$y_2 = 0$	$x_2 = \frac{k}{m\sqrt{3}}$	$y_2 = \frac{k}{m}$	$x_2 = \frac{2k}{m\sqrt{3}}$	$y_2 = 0$

2.2. Synthetic measures

In social-economic researches, if we want to consider and to order multidimensional population, we need to distinguish some diagnostic features. The stimulant is the feature that has higher values and has better property due to it. The destimulant

is the feature that high values show bad situation. For the ranking of the diagnostic features synthetic measures are constructed.

In the article there are presented 3 methods (see [3]). First of them consists in unitarisation of features. In order to unitarise a stimulant we need to apply the formula (3):

$$x_{ij} := \frac{x_{ij} - \min_i x_{ij}}{\max_i x_{ij} - \min_i x_{ij}}, \quad (3)$$

and to unitarise a destimulant the following one:

$$x_{ij} := \frac{\max_i x_{ij} - x_{ij}}{\max_i x_{ij} - \min_i x_{ij}}. \quad (4)$$

At the end we calculate the arithmetic mean of new diagnostic measures x_{ij} .

In the second method we have to normalise the diagnostic feature in the following way. When x_{ij} is stimulant we have

$$x_{ij} := \frac{x_{ij}}{\max_i x_{ij}}. \quad (5)$$

If x_{ij} is destimulant we have

$$x_{ij} := \frac{\min_i x_{ij}}{x_{ij}}. \quad (6)$$

At the end we also calculate the arithmetic mean of new diagnostic measures x_{ij} .

The third method is called the Hellwig's method and it consists in standardisation of features, that is

$$x_{ij} := \frac{x_{ij} - \bar{x}_j}{s_j}.$$

Then the Hellwig's measure is calculated. The standard point is as follows

$$\mathbf{x}_0 = \begin{cases} \max_i x_{ij} & \text{for } j \in S, \\ \min_i x_{ij} & \text{for } j \notin S, \end{cases}$$

where S is the standardised set of stimulants.

The synthetic measure has the following form:

$$d_i = 1 - \frac{d_{i0}}{d_0}, \quad (7)$$

where d_{i0} means Euclidean distance from standard point $d_0 = \bar{d}_0 + s_d$, where $\bar{d}_0$ is arithmetic mean of d_{i0} and s_d is standard deviation of d_{i0} .

Euclidean distance is calculated by using the following formula:

$$d_{i0} = d(\mathbf{x}_i, \mathbf{x}_0) = \left[\sum_{j=1}^p (x_{ij} - x_{0j})^2 \right]^{1/2}$$

The synthetic measures are used later. They are compared with other results.

3. The analysis against a background of Poland and Wrocław agglomeration

3.1. Unemployment and inflow of job offer

In Table 2 there are presented jobless number in 5 years, structure of unemployment in poviats against a background of agglomeration, unemployment structure dynamics relatively to former year.

We can see that the jobless number increased in relation to the year 2000 but in the year 2004 the jobless number was smaller than in the year 2000. The dynamics in the year 2004 in comparison with the year 2000 has the growing trend. Several poviats have small decrease (i.e. Oleśnica, Oława, Środa, Wołów). The jobless number rose over 50% in Wrocław powiat and Wrocław city.

The biggest percentage of jobless in Wrocław agglomeration is in Wrocław city (34-44%) and then in Oleśnica (11-14.5%). The smallest one is in Milicz.

The biggest outflow from joblessness in all poviats is by the reason of taking up work (over 50%). The biggest outflow is in Wrocław city (38-40%). In Oleśnica it amounts to 12.5-13.5%, and in Oława to 9.7-11%.

We observed also the inflow of job offers and its dynamics. This dynamics is presented in Table 3.

We can see that inflow of job offer is decreasing in the year 2001 in relation to the year 2000. Generally inflow of job offers had upward trend in next years. In the year 2004 in comparison with 2000 there was the biggest inflow in Oleśnica, Wrocław city and Wrocław powiat. In Wołów and Milicz the inflow of job offers is still decreasing.

Table 2. The registered unemployed persons in the years 2000-2004 (at the end of December)

Location	Years					
	2000	2001	2002	2003	2004	
	persons					
Poland	2702576	3115056	3216958	3175674	2999601	
Lower Silesia	231653	267435	279309	278271	257129	
Wrocław agglomeration	62549	77075	84924	86116	81009	
Milicz	2978	3413	3398	3567	3414	
Oleśnica	9040	10644	10706	10121	8952	
Oława	6108	7038	7486	7361	6082	
Strzelin	4139	4998	5076	5093	4990	
Środa Śląska	4146	4776	4366	4175	4114	
Trzebnica	5843	7199	7199	7339	6930	
Wołów	4162	4612	4454	4473	4128	
Wrocław	4402	5878	6827	6996	6974	
Wrocław city	21731	28517	35412	36991	35425	
Wrocław agglomeration	fraction					
	100	100	100	100	100	
Milicz	4.8	4.4	4.0	4.1	4.2	
Oleśnica	14.5	13.8	12.6	11.8	11.1	
Oława	9.8	9.1	8.8	8.5	7.5	
Strzelin	6.6	6.5	6.0	5.9	6.2	
Środa Śląska	6.6	6.2	5.1	4.8	5.1	
Trzebnica	9.3	9.3	8.5	8.5	8.6	
Wołów	6.7	6.0	5.2	5.2	5.1	
Wrocław	7.0	7.6	8.0	8.1	8.6	
Wrocław city	34.7	37.0	41.7	43.0	43.7	
Poland	dynamics: previous year = 100				2000 = 100	
	x	115.3	103.3	98.7	94.5	111.0
Lower Silesia	x	115.4	104.4	99.6	92.4	111.0
Wrocław agglomeration	x	123.2	110.2	101.4	94.1	129.5
Milicz	x	114.6	99.6	105.0	95.7	114.6
Oleśnica	x	117.7	100.6	94.5	88.4	99.0
Oława	x	115.2	106.4	98.3	82.6	99.6
Strzelin	x	120.8	101.6	100.3	98.0	120.6
Środa Śląska	x	115.2	91.4	95.6	98.5	99.2
Trzebnica	x	123.2	100.0	101.9	94.4	118.6
Wołów	x	110.8	96.6	100.4	92.3	99.2
Wrocław	x	133.5	116.1	102.5	99.7	158.4
Wrocław city	x	131.2	124.2	104.5	95.8	163.0

Table 3. Inflow of job offers in the years 2000-2004

Years	2000	2001	2002	2003	2004	2004
	dynamics: previous year = 100					2000 = 100
Poland	x	76.6	119.3	133.1	107.4	130.6
Lower Silesia	x	70.7	108.9	142.4	112.6	123.3
Wrocław agglomeration	x	84.7	100.8	145.5	118.2	146.8
Milicz	x	91.8	88.5	112.1	97.7	88.9
Oleśnica	x	112.4	106.5	139.9	119.2	199.5
Oława	x	70.0	155.1	125.8	83.6	114.2
Strzelin	x	60.5	134.4	161.8	103.5	136.1
Środa Śląska	x	65.1	127.7	146.6	107.9	131.6
Trzebnica	x	84.5	120.0	111.7	107.0	121.2
Wołów	x	75.8	99.4	120.6	67.2	61.0
Wrocław	x	51.5	118.0	136.8	192.0	159.6
Wrocław city	x	86.7	86.2	168.0	131.4	165.0

3.2. Chosen categories of unemployment in the years 2000 and 2004

Different categories of registered jobless people are considered. From 50 to 60% of the unemployed are women. A percentage of people having the rights to the unemployment benefit was in the range 20-24% in the year 2000 and in range 14-20% in 2004. This percentage was smaller in Wrocław poviats and Wrocław city and it amounted to 12.9 and 14.9% respectively in the year 2000 and 9.4 and 9.6% in 2004. More than 70% of all the unemployed people were those who had ever worked. Only in Wrocław this percentage was smaller (50%). The most unemployed living in the country were in Środa (about 80%). The smallest percentage was in Oława (about 30%). The percentage of handicapped was slight. It was included in the range 0.8-3%. Only in Wrocław 4% of unemployed were handicapped.

We also researched the registered unemployed persons according to practice of work. The biggest percentage of this were the people who had never worked. The range of these unemployed was 17-30% in the year 2000. In 2004 the percentage of never working persons was much smaller, usually below 20%. In Trzebnica and in Strzelin this percentage was about 28%.

We observed also the growth of percentage of people with longer practice of work. We can see it on the ternary graph (Fig. 1). The graph shows that there was big increase in the number of jobless with up to 10 years practice and small decrease in the number of jobless with over 10 years practice. There was also significant decrease in the number of jobless persons without practice in agglomeration, Wrocław and Wrocław city in comparison to 2000. In another poviats there was increase in the number of jobless with over 10 years practice (also in agglomeration), and decrease in the number of jobless with up to 10 years practice and without practice.

In Fig. 2 there is visible the growth trend of older jobless in all poviats and agglomeration in the year 2004 in comparison with 2000.

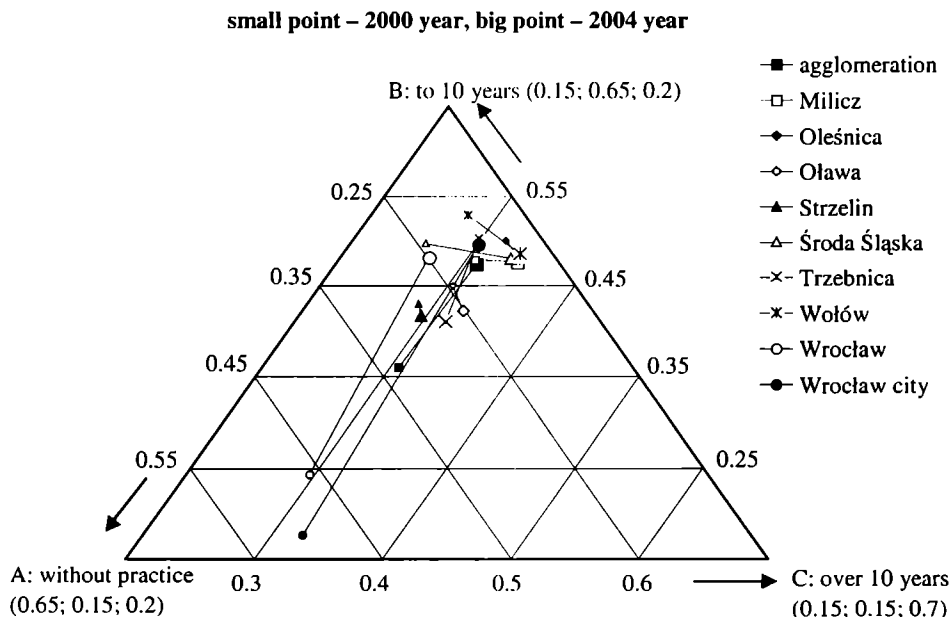


Fig. 1. The registered unemployed persons according to practice of work in the years 2000 and 2004

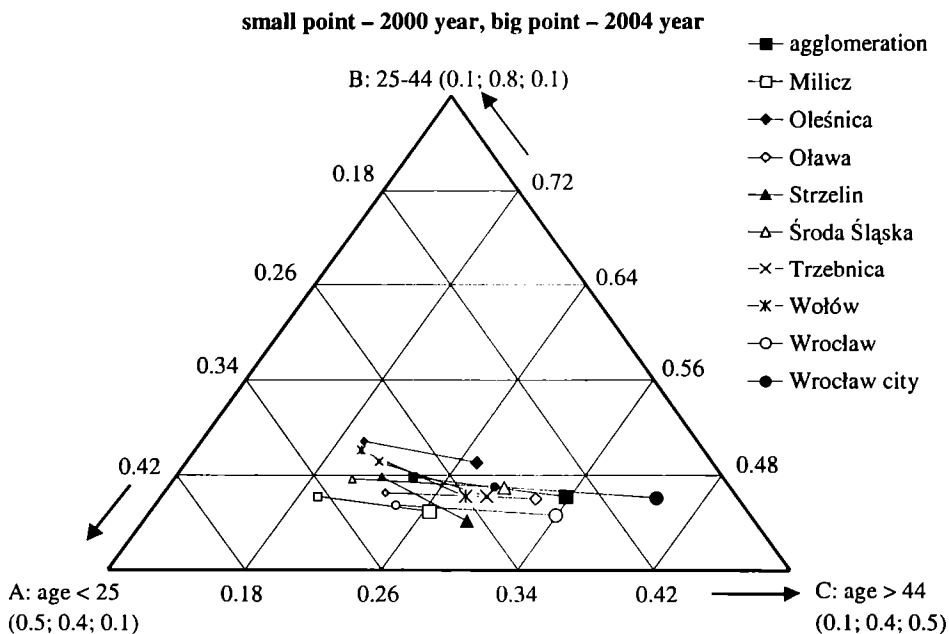


Fig. 2. The registered unemployed persons according to age in the years 2000 and 2004

We can also notice that the distribution of jobless age in 2000 was similar in Poland, agglomeration and poviats excluding only Wrocław city. In Lower Silesia and Strzelin there was a little higher unemployment among persons at the age of 35-44 than among at age of 25-34 years old. The biggest groups of jobless represented young people aged below 25. This distribution is presented in Fig. 3.

The educational status was split into five parts, that is higher, technical, secondary, vocational (but not secondary) and together primary and grammar. The technical education is after secondary but it is not higher education and vocational secondary education. The last part includes also persons without profession.

We observed that the last two groups are very large (Fig. 4). These both groups make up over 70% of all jobless. Unemployment among people with higher and secondary secondary education was under 5%. In Wrocław city the situation is different, this percentage was twice as much. Notice that in 2004 unemployment among high schools graduates increased. Some aspects of unemployment are also considered in the further part of article.

3.3. The registered unemployed persons according to large and elementary professional groups

There are ten large professional groups in Poland. Persons without profession represent the eleventh group. The large groups are as follows:

- 1) representatives of authorities, officials and managers,
- 2) experts,
- 3) technicians and another middle personnel,
- 4) office workers,
- 5) personal services workers and salesmen,
- 6) farmers, gardeners, foresters and fishermen,
- 7) industrial workers and craftsmen,
- 8) operators and fitters of machines and apparatuses,
- 9) the simple jobs workers,
- 10) armed forces.

Industrial workers and craftsmen are the biggest group. Unemployment among them ranges from 25% to 36%. Only in Wrocław city this percent is smaller – about 19%. The second biggest group are 5) and 9). In Wrocław poviats and Wrocław city there are more persons without profession. In 2004 big increase in the number of jobless was observed in second, third and eleventh groups. This growth was about 70% and more. Armed forces were not registered in year 2004.

There are 385 elementary professional groups and persons without profession in Poland. In Table 4 are presented three the most numerous elementary groups. There are the registered unemployed persons and inflow of job offers in the years 2000 and 2004.

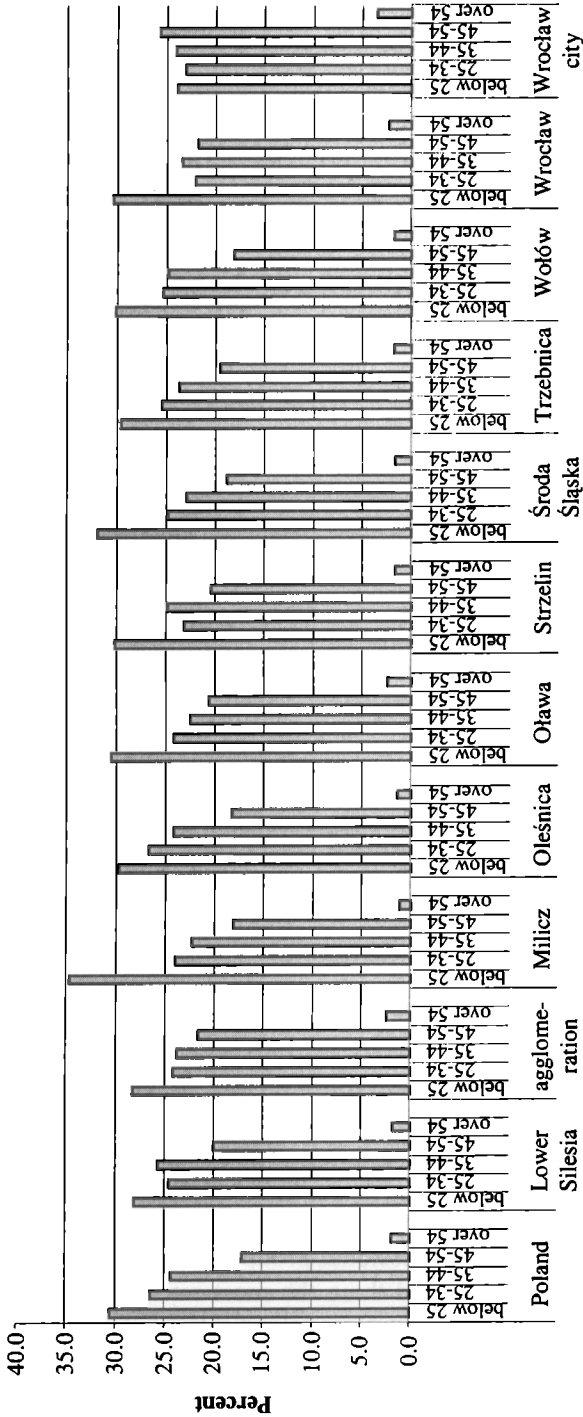


Fig. 3. The registered unemployed persons according to age at the end of December 2000

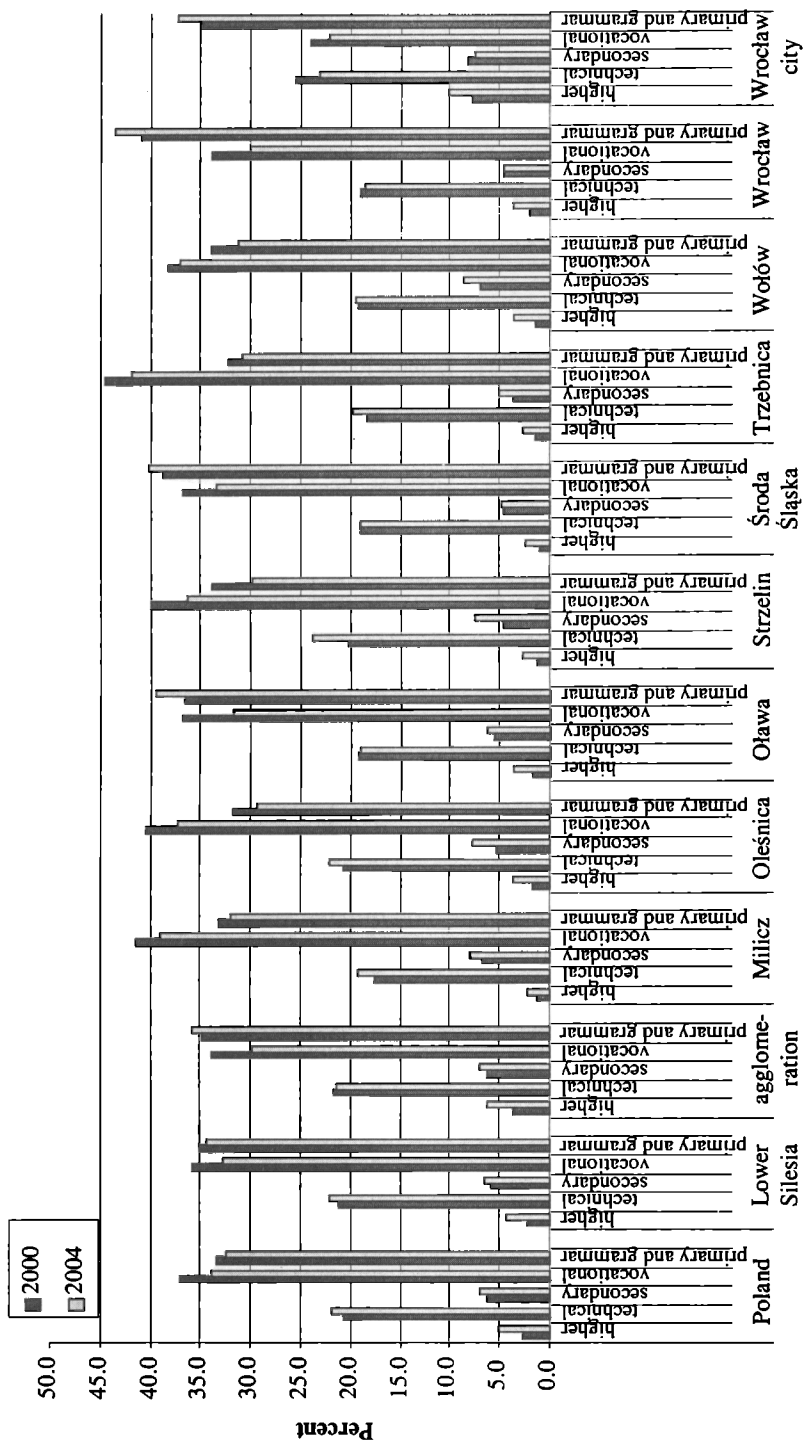


Fig. 4. The registered unemployed persons according to educational status in the years 2000 and 2004 (at the end of December)

Table 4. The registered unemployed persons (at the end of December) and inflow of job offers in the years 2000 and 2004

Registered unemployed persons				Inflow of job offers			
Year 2000				Year 2000			
Elementary professional group	Persons	Fraction (in %)	Dynamics: 2000 = 100	Elementary professional group	Persons	Fraction (in %)	Dynamics: 2000 = 100
Agglomeration	62549	100	x	Agglomeration	14286	100	x
Without profession	8762	14.0	x	Salesmen and demonstrators	987	6.9	x
Salesmen and demonstrators	5417	8.7	x	Industrial simple job workers	813	5.7	x
Helpers and cleaning ladies (in offices, hotels, etc.)	2253	3.6	x	Seamstresses, embroidered persons, etc.	795	5.6	x
Year 2004				Year 2004			
Agglomeration	81009	100	129.5	Agglomeration	20475	100	143.3
Without profession	15059	18.6	171.9	Salesmen and demonstrators	1544	7.5	156.4
Salesmen and demonstrators	6297	7.8	116.3	Another office workers	1368	6.7	172.1
Helpers and cleaning ladies (in offices, hotels, etc.)	2754	3.4	122.2	Administrative workers, secretaries, etc.	867	4.2	795.4

We can notice that the elementary professional groups of the registered unemployed persons are the same in both years. The biggest group is without profession. There are no job offers for persons of this group. Now calculate the inflow of job offers in comparison with the number of jobless. For salesmen it is equal to 15% and 21.7% in the years 2000 and 2004, respectively. There is visible increase in jobless number as well as inflow of job offers in the year 2004.

4. Analysis of synthetic measures

4.1. Analyzed diagnostic features

The following diagnostic features are analysed:

- 1) x_1 – rate of unemployment in poviats,
- 2) x_2 – inflow of jobless in comparison to incorporate job offer,
- 3) x_3 – percent of outflow of jobless to work,

- 4) x_4 – percent of jobless remaining without work over 12 months,
- 5) x_5 – percent of jobless aged over 45,
- 6) x_6 – percent of jobless with grammar and primary education.

Only third feature is stimulant, the other features are destimulants. The diagnostic features are divided into two groups that are basic and structural variables. The first group represents the features 1), 2) and 3). The poviat situation synthetic measure is weight mean of synthetic measures of both groups. The weight of basic variables is equal to 2/3. The values of diagnostic features are presented in Table 5.

Table 5. The values of diagnostic features in the year 2000

Location	x_1 (%)	x_2 (person/unit)	x_3 (%)	x_4 (%)	x_5 (%)	x_6 (%)
Milicz	19.3	4.2	57.4	39.4	19.1	33.1
Oleśnica	22.4	8.0	53.4	44.1	19.5	31.7
Oława	21.0	10.7	47.0	40.7	22.9	36.6
Strzelin	21.4	11.3	60.5	44.0	22.0	33.9
Środa Śląska	20.5	9.5	47.6	42.0	20.4	38.7
Trzebnica	19.8	14.1	49.5	40.9	21.2	32.1
Wołów	19.9	9.0	48.0	42.9	19.8	34.0
Wrocław	12.3	13.1	44.6	37.9	24.0	40.8
Wrocław city	7.2	6.7	40.5	30.2	29.1	34.8

Table 6. The values of diagnostic features in the year 2004

Location	x_1 (%)	x_2 (person/unit)	x_3 (%)	x_4 (%)	x_5 (%)	x_6 (%)
Milicz	24.6	5.5	49.5	47.2	26.3	31.9
Oleśnica	24.4	4.9	49.1	47.0	27.1	29.3
Oława	24.3	11.7	42.6	49.1	32.0	39.5
Strzelin	31.1	10.9	55.7	51.3	29.0	29.9
Środa Śląska	22.3	7.7	46.1	47.8	29.8	40.2
Trzebnica	26.8	15.9	46.7	49.3	29.1	30.8
Wołów	23.0	16.5	50.2	52.0	27.9	31.2
Wrocław	19.5	11.4	51.7	58.6	33.9	43.4
Wrocław city	12.4	5.8	49.7	55.9	39.1	37.3

The best situation is when the value of measure is bigger. The darker colour means the biggest value and the brighter one means the smallest value. The first variable is the rate of unemployment. This quantity is calculated by using the following form:

$$\text{rate of unemployment} = \frac{\text{number of jobless}}{\text{number of professionally active persons}}$$

The best situation was in Wrocław city and the worst one in Oleśnica. Similar situation was in 2004 what is presented in Table 6. The rate of unemployment increased. The biggest rate was in Strzelin.

The biggest percent of outflow of jobless to work was in Strzelin so here the situation was the best. The worst situation in this aspect was in Wrocław city in the year 2000 and in Oława in the year 2004.

4.2. Synthetic measures comparison

In the article there are presented values of synthetic measures for the years 2000 and 2004. Table 7 presents values of measures calculated by three methods and ranking for basic variables. The darker color means the two highest positions and the brighter means the two lowest position.

Table 7. The synthetic measures and ranking for basic variable

Year 2000						
Location	Method I		Method II		Method III	
	value of measures	order	value of measures	order	value of measures	order
Milicz	0.68	1	0.77	1	0.70	1
Oleśnica	0.42	4	0.58	3	0.41	3
Oława	0.25	8	0.50	8	0.18	8
Strzelin	0.45	3	0.57	4	0.34	5
Środa Śląska	0.31	7	0.53	7	0.30	6
Trzebnica	0.21	9	0.49	9	0.04	9
Wołów	0.35	5	0.54	6	0.37	4
Wrocław	0.32	6	0.55	5	0.22	7
Wrocław city	0.58	2	0.77	2	0.46	2
Year 2004						
Location	Method I		Method II		Method III	
	value of measures	order	value of measures	value of measures	order	value of measures
Milicz	0.61	3	0.76	3	0.63	3
Oleśnica	0.62	2	0.80	2	0.62	4
Oława	0.26	8	0.56	8	0.10	9
Strzelin	0.49	6	0.62	6	0.34	7
Środa Śląska	0.50	5	0.67	4	0.52	5
Trzebnica	0.20	9	0.54	9	0.11	8
Wołów	0.34	7	0.58	7	0.40	6
Wrocław	0.58	4	0.66	5	0.77	2
Wrocław city	0.82	1	0.91	1	0.88	1

All methods give comparable results. The best situation was in Milicz and the worst in Trzebnica. Wrocław city takes the second position. In the year 2004 the best situation was in Wrocław city. Milicz was third in ranking. The worst situation was in Trzebnica and Oława in 2004.

The structural variables are presented in Table 8. Notice that synthetic measures for structural variable give different results in the year 2000. So the comparison of situation in both years is difficult in this case.

Table 8. The synthetic measures and ranking for structural variable

Year 2000						
Location	Method I		Method II		Method III	
	value of measures	order	value of measures	order	value of measures	order
Milicz	0.73	1	0.91	1	0.61	1
Oleśnica	0.65	3	0.89	2	0.11	8
Oława	0.44	7	0.81	8	0.36	5
Strzelin	0.49	6	0.83	6	0.07	9
Środa Śląska	0.42	8	0.82	7	0.22	7
Trzebnica	0.66	2	0.87	3	0.45	3
Wołów	0.59	4	0.87	4	0.24	6
Wrocław	0.32	9	0.79	9	0.39	4
Wrocław city	0.55	5	0.86	5	0.51	2
Year 2004						
Location	Method I		Method II		Method III	
	value of measures	order	value of measures	value of measures	order	value of measures
Milicz	0.93	2	0.97	2	0.99	2
Oleśnica	0.98	1	0.99	1	1.00	1
Oława	0.55	7	0.84	7	0.68	7
Strzelin	0.79	4	0.93	4	0.92	4
Środa Śląska	0.63	6	0.86	6	0.73	6
Trzebnica	0.83	3	0.94	3	0.95	3
Wołów	0.77	5	0.93	5	0.90	5
Wrocław	0.13	9	0.75	9	-0.01	9
Wrocław city	0.22	8	0.77	8	0.09	8

The methods give the same results for the year 2004. The best situation was in Milicz and Oława, the worst in Wrocław and Wrocław city. The situation is bad because the research diagnostic features have big values.

In Table 9 the synthetic measures for both groups of variables are presented. In the year 2000 there are different results. The best situation was in Milicz poviat and Wrocław city. In the year 2000 the worst situation was in Oława.

Table 9. The synthetic measures and ranking for basic and structural variables

Year 2000						
Location	Methods I		Methods II		Methods III	
	value of measures	order	value of measures	order	value of measures	order
Milicz	0.70	1	0.82	1	0.67	1
Oleśnica	0.50	3	0.68	3	0.31	4
Oława	0.32	9	0.61	9	0.24	8
Strzelin	0.46	4	0.66	4	0.25	7
Środa Śląska	0.35	7	0.63	7	0.27	6
Trzebnica	0.36	6	0.62	8	0.18	9
Wołów	0.43	5	0.65	5	0.33	3
Wrocław	0.32	8	0.63	6	0.28	5
Wrocław city	0.57	2	0.80	2	0.48	2
Year 2004						
Location	Methods I		Methods II		Methods III	
	value of measures	order	value of measures	value of measures	order	value of measures
Milicz	0.71	2	0.75	1	0.75	1
Oleśnica	0.74	1	0.74	2	0.74	2
Oława	0.36	9	0.30	9	0.30	9
Strzelin	0.59	4	0.53	6	0.53	6
Środa Śląska	0.54	5	0.59	4	0.59	4
Trzebnica	0.41	8	0.39	8	0.39	8
Wołów	0.48	6	0.57	5	0.57	5
Wrocław	0.43	7	0.51	7	0.51	7
Wrocław city	0.62	3	0.62	3	0.62	3

The best situation was in Milicz and Oleśnica in the year 2004. Wrocław city is third in ranking. From this point of view here general situation is better than for basic and structural variables treated separately. The worst situation was in Oława and Trzebnica.

5. Summary

We analysed the situation of unemployment in Wrocław agglomeration. The synthetic measures shows that Milicz and Wrocław city have the best situation. But we have to remember that not all diagnostic features were taken into consideration. If we research the percent of jobless remaining without work over 12 months, percent of jobless at the age over 45 and percent of jobless with grammar and primary education, we can say that the situation in Wrocław city is bad. Percentage of the

unemployed is big in Wrocław city but here is also the biggest inflow of job offers. The inflow to unemployment is decreasing here. The worst situation is in Oława.

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SYTUACJA NA RYNKU PRACY W AGLOMERACJI WROCŁAWSKIEJ

Streszczenie

W artykule przedstawiono badanie przeprowadzone w aglomeracji wrocławskiej dotyczące lat 2000-2004. Analizowane jest bezrobocie w dziewięciu dolnośląskich powiatach: milickim, oleśnickim, oławskim, strzelińskim, średzkim, trzebnickim, wołowskim, wrocławskim i w mieście Wrocławiu. Sytuacja w tych powiatach jest porównywana z sytuacją w całej aglomeracji wrocławskiej, na Dolnym Śląsku i w Polsce. Dane pochodzą z wojewódzkich i powiatowych urzędów pracy.

Zastosowano różne narzędzia statystyczne w celu analizy sytuacji na rynku pracy, np. wykres trójkątny i mierniki syntetyczne. Zbadano dynamikę oraz obliczono odsetki i rozkłady empiryczne niektórych cech w powiatach i aglomeracji wrocławskiej. Z analizy wynika, że najlepsza sytuacja jest w powiecie milickim i w mieście Wrocławiu, a najgorsza w powiecie oławskim.

Słowa kluczowe: bezrobocie, rynek pracy, aglomeracja wrocławska, wykres trójkątny, mierniki syntetyczne.