

Original article

## Forecasting of socio-economic security in the region on the example of Lower Silesia

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### INFORMATION

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### ABSTRACT

Nowadays, the concept of security has a much broader range of meaning than in the past, mainly associated with dynamic social, technical, military, and political development. This article aims to present the forecasting process in the region in the “Multifactorial model of socio-economic security” (research project No. 108/WZA/61DzS conducted as part of statutory research at MULF). The paper presents the process and results of forecasting socio-economic security in the region on the example of Lower Silesia counties. In the first part of the paper, the choice of the topic was justified, and the methodological assumptions were presented. Then, the forecasts of socio-economic security for the studied region in the form of a table and maps were presented.

### KEYWORDS

socio-economic security, forecasting, region, county, Lower Silesia

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## Introduction

The purpose of this paper is to present the process of forecasting in the region in the “Multifactorial model of socio-economic security” (scientific and research project No. 108/WZA/61DzS conducted as part of statutory research at the General Tadeusz Kościuszko Military University of Land Forces).

### 1. Multifactorial nature of socio-economic security

Nowadays, the concept of security has a much broader meaning range than in the past, which is associated mainly with dynamic social, technical, military, and political development. As a rule, it is defined as a state free of anxiety, creating a sense of certainty. It is coming from the etymological side, “security” is “a state without custody” – from the Latin word sine cura – securitas [1]. Socio-economic security is a component of general security, which is confirmed by Kazimierz Książkowski distinguishing its four dimensions: financial, raw material

and energy, food, and access to clean water [2]. In his reflections on expending forces and means for security, Oskar Morgenstein recommends that the following alternative should be taken into account: "If we overestimate the opponent's forces, we will waste our effort and deplete the treasury, but if we underestimate it, we will lose our lives and state system" [3]. A series of arguments for the fact that socio-economic security is an integral part of state security and was implemented on many levels by Bolesław Balcerowicz, emphasizing the importance of this component in the overall security structure: "In the tradition of thinking about security very often abundance, prosperity and wealth they are placed among its conditions. For a long time, happiness, prosperity, and certainty of people's efforts to implement their lives (its prolongation and improvement) were made conditional upon economic conditions. They were and are an element, a pillar, and a factor and a condition for security, and they were expressed by the component called economic security today" [4]. Simultaneously, as Adam Korcz claims, the economic threat may be accompanied by political or military stabilization and vice versa [5]. Poland currently faces such a situation. Ryszard Zięba, in turn, points to five groups of factors that shape socio-economic security: political, economic, military-defense, geostrategic, and infrastructural factors [6], while the most important include economic and political factors. Attention should be paid to military and economic conditions, which are also an essential sphere regarding state security because it is up to them to meet the military needs of the state. Such conditions include, among others, the ratios of defense expenditures in GDP, indicators of the employment in the armaments industry, indicators of research and scientific work related to defense, and others. A. Korcz, considering the specifics of security determinants, divides them into absolute and relative ones. In absolute terms, it is the size of GDP, the amounts allocated for savings and investments, the amount of imported oil and gas, the value of exports, the sum of funds for national defense, etc. relative to state and economic processes by comparing and comparing absolute indicators. In combination with another feature or other relationship or dependence, they allow to determine the presence or predict the existence of other characteristics of description or dependence. They also allow the building of value judgments, as well as the detection of dependencies and relationships. Always recurring relationships and relationships are the basis for building laws and regularities [5]. Taking into account external factors shaping the economic security of the country there should be taken into account [7, p. 95]: stability of the international economic and financial system, favorable international economic situation, the degree of material dependence on external entities, the degree of financial dependence on external entities – international indebtedness and a position in the system of international economic relations enabling the benefits of international trade and foreign investment, affiliation to business organizations, and especially integration.

As Immanuel Wallerstein observes, the liberalization of trade confirms the uneven economic development of the world, which leads to the division into states of the center, periphery and semi-peripheries [8]. The center is highly developed, and derives raw materials and cheap labor from less developed areas, which is definitely not based on mutual benefits, but rather on exploitation and growing inequalities in society. In the European Union, this division is clearly visible, where Germany, France and the United Kingdom have become the central countries, while the countries of Central and Eastern Europe are its peripheries. The same division can be applied to the regions of the country, e.g. in Poland, where the difference between the western and southern voivodships is marked, and the so-called "The Eastern wall".

Disproportions in socio-economic development may increase the level of threats in the areas (including in regions) of the weaker ones, at the same time causing dependence on stronger ones. As Krzysztof Michał Książopolski points out, the most commonly used methods in this respect are: “dependence on exports, to such an extent that it is impossible to improve the situation by any change in tariff or non-tariff means of market protection in a given country; dependence on imports from a given country to such an extent that the interruption or limitation of supplies may lead to economic collapse” [2]. Therefore, the overriding task in creating socio-economic security is the correct identification of its determinants, and the concentration of resources and tools on appropriately selected determinable determinants of high rank. In the scientific project “Multifactor model of socio-economic security”, factors shaping the level of economic development and factors determining the living conditions of the population, colloquially known as factors shaping the standard of living, were recognized as such.

## **2. Methodology for the construction of socio-economic security forecasts in the region**

The forecasts of socio-economic security presented in the report are part of the scientific and research project entitled “Multifactor model of socio-economic security” conducted as part of statutory research at the General Tadeusz Kościuszko Military University of Land Forces (project no. 108/WZA/61DzS). The project was carried out in two phases. In the first phase, the effect of which was to create a theoretical multifactor model for diagnosing and forecasting socio-economic security in the region on the example of Lower Silesia, a method for comparing changes occurring in the level of economic development and living standards in the studied region in a dynamic-spatial approach was developed. The model has been developed in five stages. In the first stage, measures of the level of economic development and measures of living standards were determined (determining the living conditions of the population), and then the correlation between particular measures was analyzed, which allowed their final choice. In the second stage, tables for individual measures of the level of economic development and life-quality measures were constructed, which was preceded by the construction of auxiliary tables containing the necessary statistical data extracted from the Local Data Bank of the CSO, Statistical annals of the Lower Silesian Voivodship, and CSO materials and studies. In the third stage, particular weight factors were given, which were determined based on an assessment of their impact on the level of socio-economic security made by experts in the field of economics and regional and local development. In the 4<sup>th</sup> stage, in order to bring the data to the level of comparability for each measure of both categories examined (level of economic development and standard of living) two groups of tables were constructed – the first containing absolute values (bearing the letter “a”) and the second containing distances of individual LGUs from the provincial model (Lower Silesia = 100, bearing the letter “b”). From tables marked with the letter “b”, a synthetic table was created based on which an interactive map of the whole voivodship was deleted, divided into cities on districts and counties, where the current state of individual factors was evaluated using appropriate colors (for 2004, 2010 and 2015) together with a forecast for the future, which was presented later in this paper. In the second phase, a tool for decision support in the field of socio-economic policy for the authorities of selected LGUs was created. The implementation of this phase

took place in two stages. In the first stage, reports on the state of socio-economic security of individual LGUs were prepared together with a proposal of specific actions in the field of socio-economic policy. Reports were based on the results of expert analysis. In the second stage, which is being implemented, there will be an application of the created tool for the selected local government units with a request for their assessment by the authorities at the appropriate level, which will allow verifying the accuracy of the indicated directions of socio-economic policy. A detailed research methodology was presented in the authorship paper by Maciej Popławski and Tomasz Smal (in Polish) *Podstawy metodologiczne badań nad bezpieczeństwem ekonomicznym Dolnego Śląska* [9].

The forecasts of the development of respective indicators of the level of economic development and living standards in a complex diagnosing and forecasting model of socio-economic security in a region based on the example of Lower Silesia were calculated using the linear regression method according to the following algorithm:

There were made predictions from the data extracted from the Local Data Bank of the CSO and Lower Silesia Statistical Yearbooks.

The following data prediction assumptions were performed for the forecasted year:

For the data, where standard divergence was below a particular threshold value (in the table, that value is 30%), the linear prediction was based on the simple (linear) regression equation:

$$y = a + bx \quad (1)$$

where the directional derivative  $a$  is given by the equation:

$$a = \bar{y} - b\bar{x} \quad (2)$$

and the constant term  $b$  of equation 1 is given by the following dependence:

$$b = \frac{\sum_{i=1}^N (x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^N (x_i - \bar{x})^2} \bar{y} - b\bar{x} \quad (3)$$

– If there is no linear trend for empirical data, i.e.,  $x$  as the time variable and  $y$  as the value for respective counties over time, an exponential equation (or another analytical equation) should be used.

$$y = bm^x \quad (4)$$

Forecasts for the development of individual measures have been placed in the last column of all 28 tables, where 6 of them show the indicators of the level of economic development and the 22<sup>nd</sup> level of life (determining the living conditions of the population). The meters illustrate the formation of socio-economic security of counties and cities with county rights in the years 2004-2015 in the selected region along with the forecast for the future [10].

Below is an example of a table for one of the 28 measures of socio-economic security together with the forecasts prepared (Table 1). In Table 2, the last column presents the forecasts for the formation of the socio-economic security for Lower Silesia, while in Table 3, the scale of socio-economic security is determined by the distance from the provincial model (Lower Silesia = 100).

Table 1. The number of employed persons per 1000 residents of working age

<i>x</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	<i>a</i>	<i>b</i>
LAU/year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	forecast		
city Jelenia Góra	403	409	408	415	444	444	454	437	449	459	460	458	473	5.524475524	400.7575758
city Legnica	394	401	422	435	487	487	511	506	504	512	510	526	554	12.1993007	395.2878788
city Wałbrzych	367	379	386	418	425	385	382	383	381	400	412	421	410	2.36013986	379.5757576
city Wrocław	428	445	466	499	558	553	561	570	575	599	626	659	670	19.31818182	419.3484848
bolesławiecki	256	270	273	291	300	276	279	295	296	310	318	323	323	5.038461538	257.8333333
dzierżoniowski	234	222	221	225	239	230	233	234	231	234	244	245	242	1.496503497	222.9393939
głogowski	290	290	294	314	330	318	310	309	309	321	330	320	329	2.737762238	293.4545455
górowski	193	186	185	183	190	177	177	175	169	168	178	177	169	1.685314685	190.7878788
jaworski	218	224	233	232	237	222	221	222	222	222	238	231	229	0.335664336	224.6515152
jeleniogórski	228	223	230	239	228	228	205	212	216	217	244	243	228	0.269230769	224.3333333
kamiennogórski	265	269	264	277	265	249	247	258	247	258	273	285	264	0.143356643	262.1515152
klodzki	240	237	245	245	243	242	237	231	227	237	239	247	237	0.321678322	241.2575758
legnicki	181	177	176	186	191	181	187	186	197	209	235	240	228	5.062937063	162.5909091
lubański	292	285	291	291	278	280	271	263	263	274	238	241	243	4.534965035	301.7727272
lubiński	324	333	341	359	361	358	363	364	368	369	367	372	381	3.807692308	331.8333333
lwówecki	202	206	218	218	239	208	202	200	196	199	202	204	199	1.328671329	216.4696970
milicki	268	264	266	261	264	261	248	252	257	261	270	277	264	0.171328671	261.3030303
oleśnicki	260	270	289	301	291	284	283	275	277	277	291	294	290	1.083916084	275.6212121

<i>x</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	<i>a</i>	<i>b</i>
LAU/year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	forecast		
olawski	262	304	339	388	417	394	402	426	422	468	499	516	532	19.77972028	274.5151515
polkowicki	622	624	646	696	698	687	648	693	690	707	718	762	745	9.541958042	620.5606061
strzelinski	200	210	229	235	235	235	237	241	228	231	249	250	252	3.146853147	211.2121212
średzki	254	248	275	289	287	274	272	261	279	297	308	313	307	4.241258741	252.1818182
świdnicki	279	281	287	303	319	311	312	322	318	336	345	354	355	6.395104895	272.3484848
trzebnicki	188	192	197	212	216	217	221	240	229	235	248	253	258	5.755244755	183.2575758
walbrzyski	305	309	311	332	338	311	308	308	306	162	178	169	189	13.77972028	367.6515152
wotowski	314	305	315	301	288	277	275	276	278	275	276	283	265	3.618881119	312.1060606
wroclawski	254	261	288	395	417	460	488	487	466	459	499	497	564	23.09440559	264.1363636
ząbkowicki	223	216	222	227	232	236	227	221	230	230	239	256	244	2.094405594	216.3030303
zgorzelecki	371	365	368	364	365	362	353	351	335	338	341	337	332	3.482517483	376.8030303
zlotoryjski	206	202	199	204	203	201	207	204	203	205	210	210	208	0.566433566	200.8181818
Dolny Śląsk	315	320	332	351	371	365	366	369	369	380	395	407	410	7.370629371	313.7575758

Source: Own elaboration.

**Table 2.** The synthetic measure of the level of economic development and the standard of living (determining the living standard of the population)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	forecast
city Jelenia Góra	118.24	118.82	118.81	119.08	119.66	123.44	125.66	125.47	124.95	124.43	123.41	113.98	131.11
city Legnica	161.57	163.32	161.81	160.09	158.24	160.58	161.77	163.28	162.94	162.17	160.22	157.94	164.21
city Wałbrzych	169.69	169.94	185.35	188.69	186.59	184.62	180.50	166.76	166.52	145.12	145.52	135.87	142.89
city Wrocław	166.53	167.23	166.95	166.37	166.79	168.10	172.00	176.88	177.83	175.33	176.97	165.54	179.90
bolesławiecki	85.22	90.52	87.79	92.67	91.80	93.35	91.84	88.13	90.89	90.18	91.92	89.25	93.66
dzierżoniowski	85.46	86.78	86.65	90.33	91.01	89.43	88.50	89.42	90.90	91.08	91.70	84.25	93.27
górowski	100.08	100.99	100.34	100.48	105.37	103.43	114.10	114.25	115.77	124.95	128.04	131.37	132.59
górowski	73.86	72.39	74.99	75.03	77.36	77.64	77.17	79.89	80.22	84.67	85.41	83.68	87.29
jaworski	90.85	92.83	93.78	90.06	88.46	91.21	88.52	88.14	89.45	89.00	90.41	88.01	89.72
jeleniogórski	105.49	105.52	109.67	110.01	108.08	115.17	112.40	112.01	112.34	105.29	106.91	91.85	109.89
kamiennogórski	94.59	94.72	89.68	91.68	93.30	95.87	95.02	96.56	97.24	97.24	97.73	93.26	101.09
klodzki	89.50	91.08	92.83	93.08	96.54	97.79	92.73	96.95	94.86	94.41	96.91	92.07	98.90
legnicki	120.67	111.34	109.45	111.99	114.51	120.29	113.97	114.01	118.65	95.17	98.09	96.47	100.55
lubański	88.56	88.85	91.28	94.08	96.12	93.19	97.58	95.13	93.57	96.47	95.15	89.59	98.16
lubiąński	100.88	102.07	100.35	104.37	104.79	105.81	106.42	105.06	110.22	107.23	106.25	102.71	109.84
lwówecki	86.51	81.49	88.71	88.78	87.85	87.25	91.64	88.56	85.38	90.92	88.05	91.39	92.58
milicki	80.08	75.12	82.20	81.60	79.89	106.52	106.93	98.18	95.55	92.29	90.79	87.92	101.27
oleśnicki	85.30	90.97	89.75	88.59	90.52	91.74	88.64	86.58	86.41	90.38	88.66	86.42	91.64
oławski	96.11	111.93	103.59	102.34	98.76	101.26	102.57	101.02	101.45	101.62	101.62	97.72	102.79

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	forecast
polkowicki	141.74	135.74	131.22	136.53	140.31	137.14	144.98	145.63	155.16	164.74	154.10	151.46	154.03
strzelinski	86.50	84.65	90.71	95.86	94.73	96.43	92.18	94.97	94.21	91.92	93.80	90.65	96.81
średzki	86.45	91.96	87.80	90.62	87.78	92.34	93.10	86.69	90.50	92.39	96.15	90.91	94.90
świdnicki	98.61	99.70	104.14	103.78	99.37	100.35	97.62	100.63	103.16	106.38	104.84	97.88	105.42
trzebnicki	81.31	79.29	82.23	84.88	83.43	85.72	88.93	89.99	89.80	92.27	91.60	85.96	95.49
wałbrzyski	110.57	104.95	105.49	111.11	114.93	111.57	113.75	115.47	116.99	98.51	96.01	92.74	108.37
wotowski	93.08	93.61	97.44	105.19	112.73	105.99	100.89	104.73	99.84	103.80	109.66	105.94	109.76
wrocławski	91.44	94.30	113.05	111.41	110.45	112.19	107.14	107.35	105.81	108.54	115.11	104.95	118.04
ząbkowicki	84.93	87.38	90.24	86.33	92.25	86.12	84.66	86.50	88.62	89.14	87.79	82.69	88.79
zgorzelecki	228.98	223.27	221.50	221.65	224.22	227.20	220.71	216.88	218.68	215.83	210.65	218.87	212.26
złotoryjski	84.98	88.40	88.88	95.05	94.76	96.15	99.46	94.19	94.04	95.35	94.96	89.86	99.27
Dolny Śląsk	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: Own elaboration.



**Table 3.** Scale of the level of socio-economic security

Level of socio-economic security					
VERY LOW	LOW	QUITE LOW	MEDIUM	HIGH	VERY HIGH
Distance to the benchmark: Lower Silesia = 100					
<80	81-90	91-100	101-110	111-120	121<

Source: Own elaboration.

### 3. Forecasts for the formation of socio-economic security for Lower Silesia

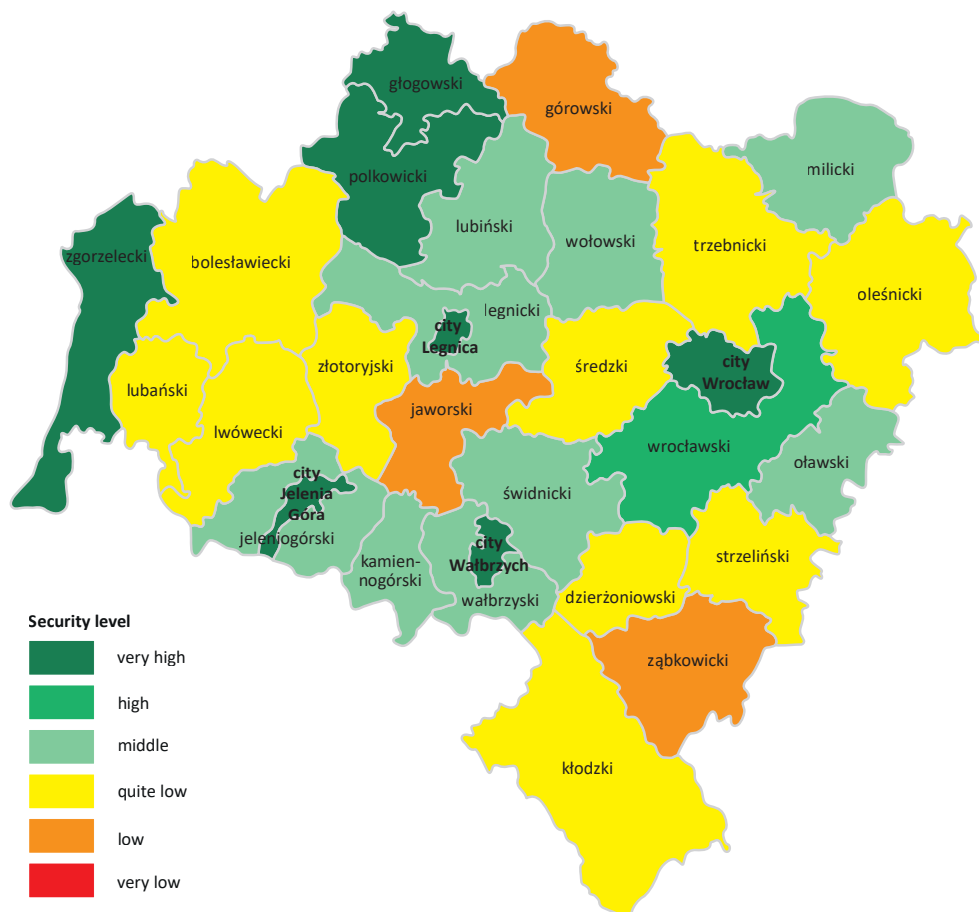
Forecasts of the formation of socio-economic security for Lower Silesia are presented in the synthetic table (Table 2). The synthetic measure of the level of economic development and living standards (determining living conditions of the population), which was performed using the weighted average method of all 28 measures of the level of economic development and standard of living). The weights were assigned to each measure by a team of experts in the field of regional and local development [9].

The map of socio-economic security forecasts for Lower Silesia, built on the basis of the development of individual measures of the level of economic development and the standard of living (determining the living conditions of the population) graphically shows the forecasted level of socio-economic security in individual cities and counties of the voivodship. Appropriate colors illustrate different levels of socio-economic security, i.e., dark green indicates a very high level of socio-economic security, green – high, aquamarine – medium, yellow – fairly low, orange – low, and red – very low (Table 3, Fig. 1). This study adopts a scale with reference to the aggregate Table 2, which is a synthetic summary of all indicators of the level of economic development and standard of living, affecting the level of socio-economic security.

In the forecasted period, a very high level of socio-economic security can still be observed in all cities with county rights and in the same three counties (in Głogów, Polkowice, and Zgorzelecki), for which the values have been established ex-post. The high level occurs only in the Poviats of Wrocław, which raised its status from medium in 9 counties (in Lubinski, Wołowski, and Milicki, which raised its level from low and in Legnicki, Kamienna Góra, Świdnicki, Wałbrzyski, Oławski and Jeleniogórskie, which they raised their level from quite low), quite low up to 10 (in Bolesławiecki, Trzebiecki, Oleśnicki, Lubański, Złotoryjski, and Dzierżoniowski, which raised their status from low and in Lwówecki, Strzeliński and Kłodzki), and low in three (in Górowski, Jaworski and Ząbkowicki). No very low level of socio-economic security was forecasted in any of the LGUs examined.

### 4. Analysis of the socio-economic security situation in Lower Silesia

Below there is a table containing a list of indicators of the level of economic development and the standard of living in their absolute values for Lower Silesia (Table 4). A detailed analysis of the changes that took place in the development of individual measures for their value was made in each case. The beginning of the analysis period, 2004, 2010, and 2015, and the forecast for the next period were considered for the final assessment of socio-economic threats. Finally, factors that could have a positive or negative impact on socio-economic for



**Fig. 1.** The socio-economic security in the cities and counties of Lower Silesia – a forecast  
*Source: Own elaboration.*

the entire province, security, ranked according to the forces assigned to them, were indicated for the entire province.

Conclusions from analyses carried out in “Multifactor model of socio-economic security” of the region can become an indication for regional and local authorities in the scope of current socio-economic policy, as well as a useful tool for future decisions in this area.

The most important factors that can have a positive impact on the socio-economic safety of the studied voivodship include:

- A growing number of working people per 1,000 working age population – 315 in 2004, 366 in 2010 and 407 in 2015, the forecast for the next period being subsequent growth to 410 (force 5).
- A double increase in GDP per capita in PLN – 24749.27 in 2004, 42284.12 in 2010, and 50030 in 2014, with forecasted subsequent increase in the next period to 57592.41 (force 5).

**Table 4.** The list of measures for the level of economic development and the standard of living for the Lower Silesian Voivodship (absolute values)

Indicator and its force	2004	2010	2015	forecast
1. Number of working people per 1,000 working age population [force 5]	315	366	407	410
2. Registered unemployment rate in % [force 4]	22.4	13.1	8.6	8.1
3. Capital expenditure in enterprises (spot prices) in million PLN per 1 enterprise [force 3]	0.022	0.030	0.044	0.045
4. Gross value of fixed assets in enterprises (fixed book value) in million PLN per 1 enterprise [force 2]	0.25	0.36	0.45	0.47
5. Gross domestic product per capita in PLN [force 5]	24749.27	42284.12	no data	57592.41
6. Number of legal entities registered in the REGON register per 1,000 population [force 2]	105	114	123	124
7. Access of population to sewage system in % [force 4]	65.7	68.1	75.7	74.6
8. Industrial emission of air pollution in t per capita [force 3]	5.758	5.604	4.420	4.649
9. Number of offences reported by the Police and prosecution in concluded preparatory proceedings per 1,000 population [force 5]	44.92	39.20	27.33	30.32
10. The number of fire outbreaks and local threats handled by the National Fire Service per 1,000 population [force 4]	11	14	16	15
11. Population density per 1 km <sup>2</sup> [force 2]	145	146	146	146
12. The number of marriages per 1,000 population [force 1]	4.7	5.6	4.5	4.8
13. The number of divorces per 1,000 population [force 1]	2.2	2.0	1.9	1.8
14. The number of deaths per 1,000 population [force 3]	9.82	10.19	10.86	10.68
15. Gross average monthly salary in PLN [force 3]	2356.89	3412.37	4204.24	4408.39
16. Household water consumption from water supply systems per capita in dam <sup>3</sup> , calculated as water consumption expressed in dam <sup>3</sup> [force 1]	33.7	32.0	32.0	31.0
17. Industrial wastewater discharge per capita in dam <sup>3</sup> [force 1]	0.045	0.049	0.033	0.034
18. Gas consumption from gas networks per capita in m <sup>3</sup> [force 1]	110.7	126.8	114.1	117.2
19. Electricity consumption per capita in kWh [force 1]	563.9	760.6	738.6	780.7
20. The number of schools for children, youth and adults per 1,000 population [force 2]	0.551	0.539	0.546	0.542
21. Beds in general hospitals per 10,000 population [force 2]	50.7	48.42	51.10	51.13

Indicator and its force	2004	2010	2015	forecast
22. Number of population per 1 pharmacy [force 1]	3714	3094	2870	2732
23. Number of population per 1 library [force 1]	3625	3926	4258	4343
24. Number of population per 1 museum or museum branch [force 1]	24663	29137	27425	31716
25. Number of population per 1 seat in regular cinemas [force 1]	148.77	112.77	106.22	98.06
26. Paved county and municipal public roads in km per 100 km <sup>2</sup> [force 2]	72.7	73.6	78.2	77.7
27. The number of vehicles and tractors registered per 1,000 population [force 1]	no data	568	694	727
28. The number of traffic accidents per 100,000 population [force 3]	103.0	78.7	78.5	83.2

Source: Own elaboration based on [11].

- A drop in the number of crimes reported by the Police and prosecution in concluded preparatory proceedings per 1,000 population: 44.92 in 2004, 39.20 in 2010 and 27.33 in 2015, the forecast for the next period being an increase to 30.32 (force 5).
- A drop by nearly 2.5 times in the registered unemployment rate in % – 22.4 in 2004, 13.1 in 2010, and 8.6 in 2015, with a forecasted subsequent decrease in the next period to 8.1% (force 4).
- A double increase in capital expenditure in enterprises (spot prices) in PLN million per 1 enterprise – 0.022 in 2004, 0.030 in 2010, and 0.044 in 2015, the forecast for the next period being 0.045 (force 3).
- An increase in gross average monthly salary in PLN from 2356.89 in 2004 through 3412.37 in 2010 to 4204.24 in 2015, with the forecast for the next period being an increase to 4408.39 (force 3).
- A drop in the number of traffic accidents per 100,000 population – 103.0 in 2004, 78.7 in 2010, and 78.5 in 2015, with the forecast for the next period being 83.2 (force 3).
- A nearly double increase in gross value of fixed assets in enterprises (fixed book value) in million PLN per 1 enterprise – 0.25 in 2004, 0.36 in 2010, and 0.45 in 2015, with the forecast for the next period being 0.47 (force 2).
- A drop in the number of population per 1 pharmacy – 3714 in 2004, 3094 in 2010 and 2870 in 2015, with the forecast for the next period being a subsequent drop to 2732 (force 1).
- A drop in the number of population per 1 seat in regular cinemas from 148.77 in 2004 through 112.77 in 2010, to 106.22 in 2015, with the forecast for the next period being a drop to 98.06 (force 1).
- An increase in the number of vehicles and tractors registered per 1,000 population – 445 in 2006, 568 in 2010 and 694 in 2015, the forecast for the next period being 727 (force 1).

On the other hand, the most important factors that may have a negative impact on the socio-economic security of the studied voivodship include:

- A limited access of population to the sewage system in % – 65.7 in 2004, 68.1 in 2010, and 75.7 in 2015, the forecast for the next period being a drop to 74.6 (force 4).
- An increase in the number of fire outbreaks and local threats handled by the National Fire Service per 1,000 population – 11 in 2004, 14 in 2010 and 16 in 2015, the forecast for the next period being 15 (force 4).

## Conclusions

To sum up the forecasts for the development of individual measures of the level of economic development and the standard of living (determining the living conditions of the population) in the Multifactor model of socio-economic security for Lower Silesia allowed to construct a map of the future security status of the region. In the forecasted period, a very high socio-economic security was observed in all cities with county rights and in three other counties, a high level in one county, quite low in as many as 10, and low in three. In none of the JSTs surveyed, there was a very low level of socio-economic security. The results of the analysis indicate that the socio-economic policy in the voivodship is well conducted in the areas of employment policy, increase in GDP, public safety, investment incentives, including fixed assets, incentives to increase wages, road safety, favorable conditions for running pharmacies and cinemas and the increase in the number of vehicles used. On the other hand, the policy in the following areas of sanitary infrastructure needs to be corrected and more comfortable to install from the level of a given LGU, the quality of fire safety services, and education regarding fire hazards at the level of the voivodship as well as a given LGU.

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## Conflict of interests

All authors declared no conflict of interests.

## Author contributions

All authors contributed to the interpretation of results and writing of the paper. All authors read and approved the final manuscript.

## Ethical statement

The research complies with all national and international ethical requirements.

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## Biographical note

**Maciej Popławski** – PhD, the head of the Department of Economics at the Faculty of Management of General Tadeusz Kościuszko Military University of Land Forces. For many years he has been researching contemporary organizations and its impact on social and economic security. In addition, he has directed/controlled a number of research projects within the framework of the statutory research of the CFRA/AWL, and for many years has been directing or co-directing the organization of a series of national and international scientific conferences organized by the CFRA in cooperation with renowned research centers from all over the country. He is the author or co-author of more than 50 scientific publications.

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## Prognozowanie bezpieczeństwa społeczno-ekonomicznego w regionie na przykładzie Dolnego Śląska

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### STRESZCZENIE

W dzisiejszych czasach koncepcja bezpieczeństwa ma znacznie szersze znaczenie niż w przeszłości, co wiąże się głównie z dynamicznym rozwojem społecznym, technicznym, wojskowym i politycznym. Celem niniejszego artykułu jest przedstawienie procesu prognozowania w regionie w „Wieloczynnikowym modelu bezpieczeństwa społeczno-

ekonomicznego” (projekt badawczy nr 108/WZA/61DzS przeprowadzony w ramach badań statutowych AWL). W pracy przedstawiono proces i wyniki prognozowania bezpieczeństwa społeczno-ekonomicznego w regionie na przykładzie powiatów Dolnego Śląska. W pierwszej części artykułu dokonano był uzasadnienie wyboru tematu oraz przedstawiono założenia metodologiczne. Następnie przedstawiono prognozy bezpieczeństwa społeczno-ekonomicznego dla badanego regionu w formie tabeli i map.

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**SŁOWA KLUCZOWE** bezpieczeństwo społeczno-ekonomiczne, prognozowanie, region, powiat, Dolny Śląsk

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