

JOURNAL OF SECURITY AND SUSTAINABILITY ISSUES

ISSN 2029-7017 print/ISSN 2029-7025 online

2016 December Volume 6 Number 2

[http://dx.doi.org/10.9770/jssi.2016.6.2\(5\)](http://dx.doi.org/10.9770/jssi.2016.6.2(5))

ASSESSMENT OF SOCIAL-ECONOMIC SECURITY OF ADMINISTRATIVE AREAS OF LATVIAN MUNICIPALITIES

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Received 10 March 2016; accepted 29 September 2016

Abstract. Social-economic security – is a basic need, both in the life of an individual, household, and in various associations of people, society and state in common. Security serves as the main condition of life of people in a certain area, that reflects as a more equal distribution of the benefits, as an economic efficiency, a a social-economic stability and security. Municipalities, realizing their specific functions, serves as primary guarantee of social-economic security of the population. Article discusses methodological aspects of the assessment of social-economic security of the state in common, as well as administrative territories of local government in particular. Article deals also with statistical indicators of social-economic security at the local level. Authors has generalized an integral indicator of social-economic development of the municipalities, that helped to estimate the level of social-economic security in the territories of municipalities in Latvia.

Keywords: social-economic security, territories of municipalities in Latvia

Reference to this paper should be made as follows: Lavrinenko, O.; Smirnov, A.; Jefimovs, N. 2016. Assessment of social-economic security of administrative areas of Latvian municipalities, *Journal of Security and Sustainability Issues* 6(2) 245–257.
DOI: [http://dx.doi.org/10.9770/jssi.2016.6.2\(5\)](http://dx.doi.org/10.9770/jssi.2016.6.2(5))

JEL classification: F52, H70, R10

1. Introduction

Works of the western scientists, as well as scientists from different countries of Central and Eastern Europe, including Russia (Huber et al. 2010; Baublys et al. 2015; Białoskórski 2012; Buzan 2007; Shadova et al. 2015; Tvaronavičienė 2012; Uberman, Žiković 2014; Tambovcev 1995; Munteanu, Tamošiūnienė 2015; Teivāns-Treinovskis, Amosova 2016.) has been used as a methodological basis of the research of social-economic security. In the literature, there are two main approaches to the concept of social-economic security: Anglo-American approach and Asian approach. According with Anglo-American approach the main purpose of an economic system is to provide an individual social-economic security and household safety (Balitskiy et al. 2014).

According with Asian approach, social-economic security means raising the national economic power. Thus, State has the right and even the duty to control an economic activity, because it influences national security (Balitskiy et al. 2014).

Anglo-American model is more close to the European approach to the concept of social-economic security, however, there are possible combinations of Anglo-American and Asian models. One of the most successful

in practical terms is the Swedish social-oriented model, which naturally includes both approaches (Buzan 2007).

Meanwhile, the study of economic security at the macro level represents some averaged value. With this approach, the results of the economic activities of municipalities are often leveled in the background of other territories of Latvia, and identification of the “bottlenecks” in their work is almost impossible. This leads to the need of analyzing the economic security of the country and of the areas of municipal level - the meso level. Another factor, that causes a necessity of taking into account the regional factors in the problem of economic security is a high degree of uneven development of municipalities in Latvia.

Most researchers define the social-economic security as a complex economic, social, geopolitical, environmental, legal and other conditions, that ensure: the creation of decent living conditions and harmonious development of each individual; prerequisites for survival during the crisis and for the future development; the protection of vital interests in relation to the resource potential, balance, dynamics of growth and development; creation of internal and external security of the immunity from its destabilizing effects; competitiveness on the world markets and stability of its financial position.

Thus, the social-economic security - the multi-dimensional concept, which includes a number of indicators, characterizing certain conditions. However, multidimensional definition goes beyond the perception of human consciousness. Therefore, to assess the level of social-economic security of the territory it is necessary to create an integral indicator, the scalar, that allows to make a comparative assessment and to rate meso level of territories.

Purpose of the article is to develop an adequate system of evaluation of social-economic security of the Latvian municipalities, as well as to test the data of 2014, derived from reports of local governments of Latvia.

2. Methodology

The representatives of the Anglo-American approach of the concept of social-economic security uses economic figures of households for the construction of the security indicator. Some researchers (Hacker et al. 2012) for the construction of an index of social-economic security offer to use the common household income, including pensions of the retired family members, planned medical expenses of the household, expenses on household debt services, amount of the financial savings and liquid property.

The authors use data, obtained from the documents of the statistical government agencies of the United States and calculated as an index for US residents. The authors hasn't used a survey method in order to make data more objective. Lars Osberg (Osberg, Sharpe 2005) integrates an indicator of social-economic security from several already existing indicators:

- 1) security index in the case of unemployment, which includes the unemployment rate in a particular territory, share of the unemployed, receiving unemployment benefits, as well as the proportion of the amount of benefit in the total income of the population;
- 2) security index in the case of illness, calculated from care costs, lost revenues due to the size of work inability, administration costs of the bankruptcy procedure due to the full or partial work inability;
- 3) security index in the case of widowhood (partial loss of the household income). The author proposes to calculate it as the multiplication of the probability of widowhood (divorce) and level of poverty among single women in the single-parent families. Poverty in this case is defined in relative terms as a percentage of households that fall below half of the medium income;
- 4) security index in the case of oldness is defined as the rate of poverty among households headed by persons older, than 65 years.

Profitably-consumable principle is put on the basis of calculation. This principle itself adequately reflects level of social-economic security, but it doesn't allow to evaluate such important factors as the total income of the

household members, their level of education, debt, savings, availability of liquid property, etc.

Anglo-American approach does not consider the influence of public authorities on the social-economic security of the territory at the country level or at the level of its region, or at the municipal level, so methodologically this approach doesn't meet the objectives of this article.

If European and American researchers percept social-economic security from the standpoint of personal security, and they aren't going beyond the households, then the post-Soviet and Asian space consider that problem from the perspective of economic indicators of the state.

Valeriu Ioan-Franc, Marius Andrei Diamescu (Ioan-Franc, Diamescu 2010) suggest to consider social-economic security indicators in the areas of GDP growth; size of GDP per capita; the volume of foreign exchange rezerves; level of inflation; unemployment rate; foreign direct investments; trade balance; amount of external debt; level of poverty.

These indicators are suitable for calculations at the national level. However, level of local government areas requires different indicators, reflecting position of the economy at the regional level or even in a smaller scale.

S. Glazyev (Glazyev 1997) in the method of determining the level of social-economic security has identified 22 key indicators. Among them: the GDP, the share of manufacturing in the industrial production, level of investments in the GDP, expenses on research, duration of life of the population, unemployment rate, inflation rate, the volume of domestic and external debt, and others. The author doesn't formulate a maximum level of these indicators. At the same time author suggests to use method of expert evaluations for the determination of level of the announced factors. As a result usage of this method reduces objectivity of the integral indicator. In addition, because of the lack of statistical data of certain parameters, this method can't be applied to the realities of the Latvian municipalities.

Other researchers have proposed a method for assessing the social-economic security of the country by means of multivariate statistical methods. In order to use this method it is necessary to stress several areas of the regional economy: industrial and agricultural spheres of production, social indicators of living standards of the population, demographic level, scope of the legislation, etc. The analysis uses 16 factor variables. As a result, four integrated index has been obtained: the interdependence between level of development of agriculture in the region and pollution; the degree of influence of investments into basic capital on the effectiveness of the regional economy; common quality of life and level of prosperity of the population; interdependence between level of wages and unemployment. Then the selected performance indicators has been chosen: the index of industrial production, index of physical volume of investments in the basic capital, the share of the population with incomes below the subsistence level, rate of natural increase (decrease) of population. Then correlation and regression analysis of the relationship between the calculated integral and performance indicators has been conducted. Certain results has been obtained, that lead to the creation of system, based on four equations. This comprehensive quantitative model describes position of the Republic of Mordovia (Novikova & Krasnikov 2010). The undoubted strengths of this approach could be considered methodological harmony and objectivity of used data and obtained results. Areas, that has been selected for analysis, reflect the social-economic situation. However, names of the specific indicators hasn't been presented by the authors, that's why it is hard to evaluate their validity.

N. Dyuzenkova (Dyuzenkova 2001) describes a methodology to evaluate level of social-economic security of the region, that has been developed in the Tambov University of Technology. It provides the allocation of the integral indicator from the system performance, that characterizes industrial, scientific, technical, financial, social-demographic, food and ecological components, consisting in the regional labor market. The number of points, assigned to a specific object of study, has determined according to the place, obtained by the specific object during the ranking according with this indicator. The final ranking is based on indicators, defined in the

following ways: firstly, the sum of the points on the entire set of indicators; secondly, as the amount of seats, that are occupied by the object for each set of parameters; thirdly, as the sum of the places, that are occupied by the object for each set of indicators, taking into account the importance of each of them.

The second variant of the methodology is based on calculating the integral index, using a modification of the method of least squares. At the same time the object with the best level of economic security should have a minimum value as the sum of the squares, and minimum value as root of that number (the standard deviation).

The third option is based on a combination of previous methods „the amount of places” and the least squares. This method is based on the account of the significance of the selected components of economic security. Initially, using method of the least squares, varieties of all the objects on all components are determined. Then the integral index is calculated by summing up the ranks of the object according to the importance of indicators. Weightings of the parameters are determined by experts.

The obvious disadvantages of the proposed methods are lack of an index of decomposition. Moreover, the method of expert assessment is subjective and isn't widely used for the calculations. As for the authors' mentioned system of indicators, it is not specific, that's why it is difficult to make a conclusion about its practical significance.

L. Yadchenko (Jadčenko 2006) has offered new classification of economic security indicators for the territory of Latvia: economic component includes such primary statistics as GDP, share of manufacturing in industrial production, volume of investments as a percentage of GDP, share of the new kind of production in the total output. Social component includes indicators of the proportion of workers with incomes below the subsistence level, the average duration of life, the difference in incomes of 10% of the population with the highest income and 10% of low-income residents, the crime rate per 100 000 inhabitants, the unemployment rate. The financial component is expressed by the annual inflation rate, by the domestic debt as a percentage of GDP, by the current level of expenses for servicing and repayment of domestic debt, external debt as a percentage of GDP, part of external loans to pay off the budget deficit, the budget deficit as a percentage of GDP, the ratio of the volume of national currency to the foreign currency, the ratio of the volume of national currency in cash to the amount of foreign currency in cash.

Work hasn't considered a municipal level. The authors conclude, that the indicators could be different in the case of taking into account the administrative territories of municipalities. In that occasion the social-economic factors, that directly affect the quality of life in a particular administrative territory, primarily are taken into account. The financial performance of local governments has considered to be at the inferior position.

A. Kuklin (Kuklin, Belik 2009), analysing works of Russian and European economists, identifies several areas of local government's activities, serving as indicators of its economic security: investments, industrial activities, scientific activities, technological activities, improvement of infrastructure, environmental activities, cultural activities, recreational activities, employment and unemployment sphere, maintaining public order, level of social welfare of population.

After analyzing the available definitions of the essence of economic security of the region, A. Melnikov and I. Snimschikova (Melnikov, Snimschikova 2006) give their own interpretation of this notion, trying to emphasize, that economic security of the region - is not so much the state of protection of regional interests, as the ability of regional authorities to establish effective mechanisms to ensure the competitiveness of the regional economy, as well as to ensure social-economic stability and sustainable development of the territory as a relatively independent structure, that is organically integrated into the national economy.

According with authors' opinion the social-economic security of the territory of the municipality is characterized by complex economic, social, ecological and other living conditions of the population of the municipalities.

After analyzing the above methods for determining the social-economic security of the area according to the criteria of methodological significance and objectivity of the data and results, validity of the included indicators, the authors concluded, that all the above methods do not always meet all the necessary requirements. That's why on the basis of an improved definition, the authors have formulated their own method of evaluation of the social-economic security on the meso level, using all available primary statistics from the reports of 119 administrative units of Latvia in 2014. In addition, the authors have used data from the Module of regional development indicators (Regional development indicators module 2016).

3. A method for constructing an integral indicator

Social-economic security - a complex social-economic category, so the primary statistical indicators of the researched regions could be represented as follows:

$$X = \begin{bmatrix} x_{11}, x_{12}, \dots, x_{1n} \\ \dots \\ x_{i1}, x_{i2}, \dots, x_{in} \\ \dots \\ x_{m1}, x_{m2}, \dots, x_{mn} \end{bmatrix}, \quad (1)$$

where m - number of regions, n - number of indicators, characterizing level of living standards. Thus, for this type of data it is justified to use a multivariate analysis.

Taking into account different units of measurement of the primary indicators, it is necessary to unify the data. The authors carried out the unification of the principle of linear scaling, in which the range of possible values is defined by a segment $[0;10]$, using the formulas (Lavrinenko, Lavrinoviča 2013):

$$x'_{ij} = \frac{x_{ij} - x_{\min j}}{x_{\max j} - x_{\min j}} \cdot 10 \quad (2)$$

– performance-stimulants and

$$x'_{ij} = \frac{x_{\max j} - x_{ij}}{x_{\max j} - x_{\min j}} \cdot 10 \quad (3)$$

– performance-destimulants, where x'_{ij} unified index value «j» for the region «i», x_{\min} and x_{\max} - the lowest (the worst) and the highest (the best) baseline values during the research period.

To determine gravity of the components on the level of social-economic security and its primary indicators, it is necessary to select the appropriate method of implementation of the factorial analysis. Various methods of factor analysis are depending on the approaches used to isolate the value of the coefficients of factors. During the analysis of principal component it is necessary to take into account all the data dispersion (Lavriņenko 2010). Diagonal correlation matrix consists of units, and the entire dispersion is involved into the matrix of factor loadings. Principal component analysis should be fulfilled if the main task of the researcher - the definition of the minimum number of factors, which make the maximum contribution to the variance of the data, to subsequently use them in the multivariate analysis. These factors are called the principal components. During the common factor analysis the factors determine only on the basis of the total variance. The Community is located on the diagonal of the correlation matrix. This method is suitable if the main objective is to define the latent variables and the total variance. For the purposes of our work method of principal components could be considered as a basic method (Kosiedowski, Lavriņenko 2014).

Thus, after the conduction of factor analysis, the authors got 7 principal components (see table below) with the total percentage of explained variance 71,1%:

Table 1. The results of the factor analysis by the method of principal components.

Area of functioning of local municipality	% of explained variance	Initial indicators	Factor's loading
1. General economic component	18.6	Revenue from personal income tax per resident of municipality	0.890
		The number of jobs per resident of municipality	0.850
		Revenues from property tax per resident of municipality	0.740
		Level of unemployment in %	0.690
		Expences on maintaining of public order per resident of municipality	0.520
2. The amount of budget of municipality	12,8	Revenues of budget of municipality per resident of municipality	0.910
		Expences of budget of municipality per resident of municipality	0.910
		Expences on household services of territory of of municipality per resident of municipality	0.590
3. The involvement of entrepreneurs in the territorial environment	11.2	Expences on advertisement per resident of municipality	0.990
		Revenues from the trade tax per resident of municipality	0.990
4. Culture and leisure in the territory of municipality	8	Expences on leisure and culture per resident of municipality	0.780
		Sales of tickets on cultural and leisure events per resident of municipality	0.750
		Revenues from taxes on gambling per resident of municipality	0.520
5. Providing social security and health care in the territory of municipality	7.8	Expences on social security per resident of municipality	0,770
		Number of employers per resident of municipality	0,450
		Expences on health security per resident of municipality	0,440
6. Environmental safety in the territory of municipality	6.7	Expences on protection of environment per resident of municipality	0,820
		Expences on education per resident of municipality	-0.530
7. Property of municipality	6	Revenues from rental property of municipality per resident of municipality	0.740

Source: authors' calculations in the programme SPSS, using 2014 year data from 119 administrative quantities of Latvia and according with the Module of indicators of regional development <http://raim.gov.lv/>

The authors used factor loadings as basics for the primary statistical indicators, because sum of their squares is equal to one:

$$\sum_{q=1}^p l_q^2 = 1 \quad (4)$$

As basics for the 7 component the authors used values of percent of explained variance, that has been structured in the same way.

Integral indicators of each of the 7 component could be calculated by the formula:

$$y_i = \sum_{q=1}^p \tilde{l}_q \cdot \tilde{x}_i^{(q)}, \quad (5)$$

where \tilde{l}_q - structured factor loadings, $\tilde{x}_i^{(q)}$ - unified primary statistical indicators, included in each of the 7 components, q – number of unified primary statistical indicators in each component, i – number of components.

The general indicator of social-economic security could be calculated by the formula:

$$Y = \sum_{i=1}^7 \tilde{m}_i \cdot y_i, \quad (6)$$

where y_i - integral indicator of each of the 7 components, \tilde{m}_i - structured percent values of explained variance.

4. Results

It is possible to make a conclusion, that the greater value of the integrated indicator, the better social-economic security in the territory of the municipality.



Fig.1. Value of the integrated indicator of social-economic security of Latvian municipalities on a scale of 1 to 4.

Source: authors' calculations in the programme SPSS, using 2014 year data from 119 administrative quantities of Latvia and according with the Module of indicators of regional development <http://raim.gov.lv/>

It is established, that the best social-economic security is in Riga (4.63) and in the edges of the Riga region: Carnikavas region (4.68), Marupes region (4.19), Stopinu region (4.14). Social-economic security is not so good in the other edges of the Riga region: Jurmala (3.81), Adazi region (3.59), Garkalne region (3.93), Kekavas region (3.23), Ogre region (3.25), Saulkrastu region (3.58). The worst social-economic security is set in the edges of the Riga region: Alojas region (1.63), Keguma region (1.98), Olaines region (1.95); in the Kurzeme region: Aizputes region (1.9), Alsungas region (1.65), Brocenu region (1.82), Grobinas region (1.91), Kuldigas region (1.99), Priekules region (1.82); in the Vidzeme region: Beverinas region (1.99), Burtnieku region (1.81), Cesvaines region (1.87), Erglu region (1.5), Lubanas region (1.59), Madonas region (1.86), Raunas region (1.63), Rujienas region (1.8), Varaklanu region (1.47); in the Zemgale region: Jekabpils (1.9), Aknistes region (1.7), Auses region (1.9), Jekabpils region (1.83), Neretas region (1.82), Plavinu region (1.63), Salas region (1.82), Viesites region (1.63); in the Latgale region - all regions have a bad social-economic security with the value of an integrated social-economic indicator from 1 to 2, except Baltinavas region (2.05), Karsavas region (2.4), Vilanu region (3.29) (Appendix 1). Thus, the social-economic security of the regions in Latvia has 2 axis: center - periphery and north-west - south-east: the closer to the capital region is located, as well as the more north-west region is located, the social-economic security is higher.

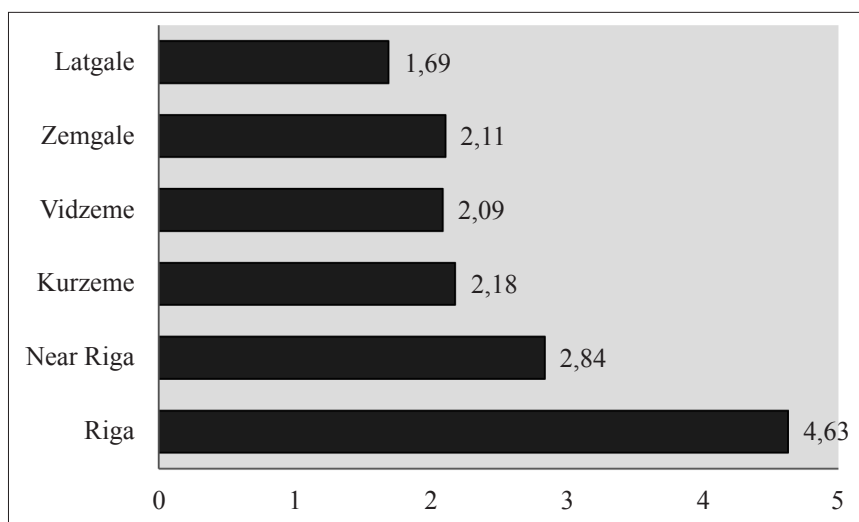


Fig. 2. Values of the general indicator of an integrated social-economic security of the region

Source: authors' calculations in the programme SPSS, using 2014 year data from 119 administrative quantities of Latvia and according with the Module of indicators of regional development <http://raim.gov.lv/>

It is established that the leadership position on the social-economic security has Riga (4.63), an outsider is Latgale region (1.69). Area, near Riga, Kurzeme, Vidzeme, Zemgale regions hold the average social-economic security level (see. Figure 2).

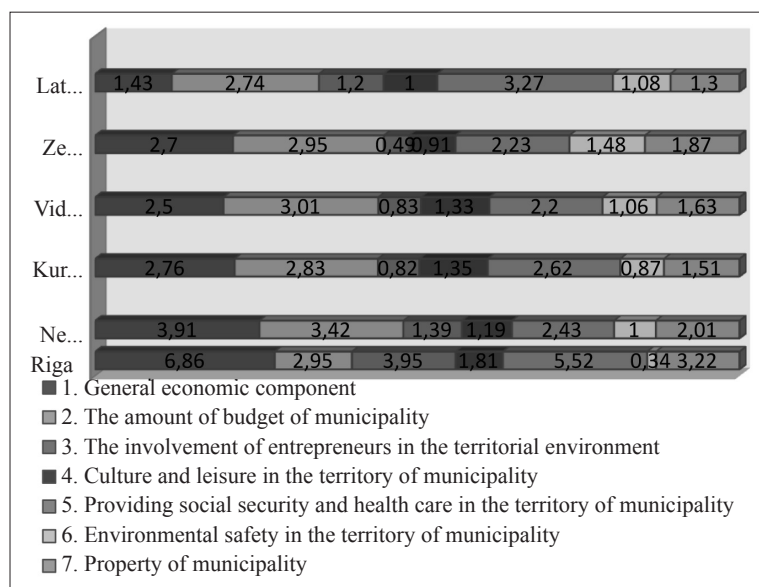


Fig.3. The values of the general component of an integrated social-economic security indicator by regions

Source: authors' calculations in the programme SPSS, using 2014 year data from 119 administrative quantities of Latvia and according with the Module of indicators of regional development <http://raim.gov.lv/>

The general economic component by regions has most different values: the overall value of the component is 4.8 times above in Riga (6.86), than in Latgale (1.43). The budget amount component values are distributed more evenly and differs more than 1,2 times in the area near Riga (3.42) and in the Latgale region (2.74). The value of the component of involvement in the business environment in the Riga region (3.95) is 8 times greater, than in Latgale region (0.49). The values of the culture and recreation component of the regions varies by almost 2 times in Riga (1.81) and in Zemgale (0.91). The amount of component of social security and health care in the territory of Riga municipality (5.52) and Vidzeme region (2.2) differs more, than 2.5 times. The amount

of component of environmental safety has the highest level in the Zemgale area (1.48), the lowest level – in Riga (0.34) and differs more, than 4.4 times. The amount of municipality's property component differs in 2.5 times: in the Riga region it has 3.22 and in Latgale region – 1.3.

The authors found, that the greatest impact on the value of the general integral indicator of municipalities has a general economic component: $r(\text{Pearson})=0.848$ ($p\text{-value}<0.001$), t.i., there is a very strong positive linear relationship between these indicators. Positive linear relationship of average force is established between the component, featuring the amount of budget of municipality and general integral indicator: $r(\text{Pearson})=0.610$ ($p\text{-value}<0.001$). A weak positive correlation established between the component of involvement of entrepreneurs in the territorial environment, as well as between component, featuring the property of municipality and general integral indicator (respectively $r(\text{Pearson})=0.371$ ($p\text{-value}<0.001$); $r(\text{Pearson})=0.308$ ($p\text{-value}<0.001$)). Very weak positive relationship is established between the component, featuring culture and leisure of the population in the territory of municipality, as well as between component of social security and healthcare of the population in the territory of municipality and general integral indicator (respectively $r(\text{Pearson})=0.199$ ($p\text{-value}=0.030$); $r(\text{Pearson})=0.221$ ($p\text{-value}=0.015$)). A linear relationship between component of the environmental safety and general integral indicator hasn't revealed ($r(\text{Pearson})=0$ ($p\text{-value}=0.626$)).

Conslusions

On the basis of chosen methodology the authors developed a methology of determining social-economic security of regions, which consists of the following steps:

- unification of all available primary statistics, featuring the definition of social-economic security, using 2014 year data from 119 administrative quantities of Latvia and according with the Module of indicators of regional development (<http://raim.gov.lv/>);
- using factor analysis of standardized statistical primary indicators by the method of principal component, areas of activity of municipalities or the components of the integrated indicator has been highlighted: general economic component, municipal improvement, the involvement of entrepreneurs in the territorial environment, recreation of population, living in the territory of municipality, providing social protection and health insurance in the territory of municipality, providing educational services and maintaining environmental safety of the territory of municipality;
- for the primary statistical indicators the authors used structured factors, which have sum of their squares equal to one;
- percent value of the explained variance has been used as components' indicator;
- integral indicator of each component is calculated as the sum of the standart primary indicators with corresponding factor loadings as weights;
- general integral indicator is a scalar, obtained as the sum of all components with standart percent quantities of explained variance as the weighting coefficients

Testing methodology has implemented, social-economic security of every region of Latvia has determined.

The authors have identified the axis of social-economic security of Latvia: center - periphery and north-west - south-east: the closer to the capital the region is located, as well as the more to the west region is located, the social-economic security is higher. Leading region with a maximum margin of social-economic security is Riga, region outsider is Latgale.

The authors have found, that the greatest impact on the value of general integral indicator of the region has general economic component. Influence of medium strength is established between component of the amount of municipal budget and a general integral indicator. Weak degree of influence has a component of entrepreneurs' involvement in the territorial environment, as well as component of property of municipality, very low influence has component of the culture and leisure of population, as well as component of social security and health care in the territory of municipality. Component of environmental safety has no effect on the social-economic security of regions of Latvia, though it is possible, that this relationship has a nonlinear feature.

References:

- Balitskiy, S.; Bilan, Y.; Strielkowski, W. 2014. Energy security and economic growth in the European Union, *Journal of Security and Sustainability Issues* 4(2): 123–130. DOI: [http://dx.doi.org/10.9770/jssi.2014.4.2\(2\)](http://dx.doi.org/10.9770/jssi.2014.4.2(2))
- Baublys, J.; Miškinis, V.; Konstantinavičiūtė, I.; Lekavičius, V. 2015. Energy efficiency as precondition of energy security, *Journal of Security and Sustainability Issues* 4(3): 197–208. DOI: [http://dx.doi.org/10.9770/jssi.2015.4.3\(1\)](http://dx.doi.org/10.9770/jssi.2015.4.3(1))
- Białoskórski, R. 2012. Cyberthreats in the security environment of the 21st century: attempt of the conceptual analysis, *Journal of Security and Sustainability Issues* 1(4): 249–260. DOI: [http://dx.doi.org/10.9770/jssi.2012.1.4\(2\)](http://dx.doi.org/10.9770/jssi.2012.1.4(2))
- Buzan, B. 2007. *People, States & Fear: An Agenda for International Security Studies in the Post-Cold War Era*. ECPR Classics Series.
- Dyuzenkova, N.V. 2001. Sistema kriteriev i pokazateley dlya otsenki sostoyaniya ekonomicheskoy bezopastnosti [The system of criteria and indicators to assess the state of economic security / NV Dyuzhenkova]. *Information Business in Russia*. - Tambov - p. 42.
- Glazyev, S.J. 1997. Osnova obespecheniya ekonomicheskoy bezopastnosti: alternativniy reformacionniy kurs [The basis of ensuring the economic security of the country: alternative course of reformation]. *Russian Economic Journal*, 1997, №2, p.5
- Hacker, J.S.; Huber, G.; Nichols, A.; Rehm, P.; Schlesinger, M.; Valletta, R.G.; Craig, S. 2012. The Economic Security Index: A New Measure for Research and Policy Analysis. Available from: <http://www.frbsf.org/economic-research/files/wp12-21bk.pdf>
- Huber, G.; Rehm, P.; Schlesinger, M.; Valletta, R. 2010. *Economic Security at Risk: Findings from the Economic Security Index*. Available from: <http://www.economicsecurityindex.org>.
- Ioan-Franc. V.; Diamescu M.A. 2010. Some Opinions on the Relation between Security Economy and Economic Security. *Romanian Journal of Economics.- Institutul de Economie Nationala*. - Vol. 31, 2(40), p. 129-159. Available from: <http://www.revecon.ro/articles/2010-2/2010-2-7.pdf>
- International Labor Organization (ILO), Socio-Economic Security Programme “Economic Security for a Better World”. 2004.
- Jadženko, L. 2006. Valsts *Ekonomiskās Drošības Indikatoru Prognozēšanas Matemātiskais Modelis*. Promocijas Darba.
- Kokstaite, M. 2011. The economic security of small states. Budapest, Hungary. p.46
- Kosiedowski, W.; Lavriņenko, O. 2014. Statistical Methods for Analysis of Regional Development as a Multidimensional Socio-economic Phenomenon. *Problems of Economic Policy of the Central and Eastern Europe Countries Macroeconomic and Regional Aspects*. Editors: Aranka Ignasiak-Szulc, Wojciech Kosiedowski. Wydawnictwo naukowe uniwersytetu Mikołaja Kopernika, Torun, pp.457-484. ISBN 978-83-231-3285-1
- Kuklin, A.A.; Belik, I. S. 2009. Influence of ekologo-economic security on investment attractiveness of the region. *Economy of Region*, 4, 155-158
- Lavriņenko, O. 2010. *Centrāleiropas un Austrumeiropas iedzīvotāju dzīves līmeņa veidošanās atšķirību pētīšana pa reģioniem*. Latgales Kultūras centra izdevniecība, Rēzekne, 228 lpp. ISBN 978-9984-29-189-5
- Lavrinenko, O.; Lavrinoviča, I. 2013. *Integrālo indikatoru konstruēšana*. Mācību metodiskais līdzeklis. Daugavpils Universitātes akadēmiskais apgāds „Saule”, ISBN 978-9984-14-645-4.
- Melnikov, A.B.; Snimshikova, I.B. Aktualnie aspekti ekonomicheskoy bezopastnosti regiona [Actual aspects of economic security of the region]. *Society and Law*. Issue number 2 (12) Available from: <http://cyberleninka.ru/article/n/aktualnye-aspekty-ekonomicheskoy-bezopastnosti-regiona>
- Munteanu, C.; Tamošiūnienė, R. 2015. Modern approaches in quantifying economic security. Case study of Estonia, Latvia, Lithuania and Republic of Moldova, *Journal of Security and Sustainability Issues* 4(4): 596–610. DOI: [http://dx.doi.org/10.9770/jssi.2015.4.4\(2\)S](http://dx.doi.org/10.9770/jssi.2015.4.4(2)S)
- Novikova, I.V.; Krasnikov, N.I. 2010. Indicators of economic safety of the region. *Bulletin of the Tomsk State University*, 330 (Jan.), 132-138.
- Osberg, L.; Sharpe, A. 2005. “How Should We Measure The ‘Economic’ Aspects Of WellBeing?” *Review of Income and Wealth*, 51(2), 311-336.
- Regional development indicators module 2016. State Regional Development Agency. Available from: <http://raim.gov.lv/>
- Rehm, P.; Schlesinger, M. 2010. *Standing on Shaky Ground: Americans’ Experiences with Economic Insecurity*. Available from: <http://>

www.economicsecurityindex.org.

Shadova, Z.; Tappaskhanova, E.; Abrahm, J.; Zumakulova, Z. 2015. Tourism security and sustainability: a case study of north Caucasus region, *Journal of Security and Sustainability Issues* 4(3): 509–519. DOI: [http://dx.doi.org/10.9770/jssi.2015.4.3\(2\)S](http://dx.doi.org/10.9770/jssi.2015.4.3(2)S)

Teivāns-Treinovskis, J.; Amosova, J. 2016. Some aspects of criminal environment impact on sustainable entrepreneurship activities, *Entrepreneurship and Sustainability Issues* 4(1): 17-27. [http://dx.doi.org/10.9770/jesi.2016.4.1\(2\)](http://dx.doi.org/10.9770/jesi.2016.4.1(2))

Tvaronavičienė, M. 2012. Contemporary perceptions of energy security: policy implications, *Journal of Security and Sustainability Issues* 1(4): 235–247. DOI: [http://dx.doi.org/10.9770/jssi.2012.1.4\(1\)](http://dx.doi.org/10.9770/jssi.2012.1.4(1))

Uberman, R.; Žiković, S. 2014. Ownership of refinery business in Croatia and Poland as a factor impacting national energy security, *Journal of Security and Sustainability Issues* 4(2): 101–121. DOI: [http://dx.doi.org/10.9770/jssi.2014.4.2\(1\)](http://dx.doi.org/10.9770/jssi.2014.4.2(1))

Annex 1

	1	2	3	4	5	6	7	Common	Colour
Riga	6.86	2.95	3.95	1.81	5.52	.34	3.22	4.63	4
Near Riga	3.91	3.42	1.39	1.19	2.43	0.99	2.01	2.84	
Jurmala	4.99	3.99	3.91	2.68	1.72	1.46	.89	3.81	3
Adazu region	5.17	4.49	2.38	.76	1.84	.45	1.48	3.59	3
Alojas region	2.00	2.17	.61	.55	2.87	.56	.99	1.63	1
Babites region	5.01	4.15	.30	1.04	3.16	.84	.72	3.25	3
Baldones region	3.47	2.37	3.16	.04	1.11	1.89	0	2.52	2
Carnikavas region	5.74	9.01	2.07	1.19	1.87	.90	1.20	4.68	4
Engures region	3.20	4.12	1.73	.64	.96	2.08	2.89	2.69	2
Garkalnes region	5.75	5.39	0	1.61	4.60	.76	1.84	3.93	3
Ikskiles region	4.02	4.19	.64	.45	1.22	.03	.86	2.69	2
Inchukalna region	3.37	1.72	2.02	.76	2.34	.57	3.07	2.38	2
Jaunpils region	3.01	2.30	1.23	1.60	3.57	.90	1.20	2.31	2
Kandavas region	2.61	2.98	.07	1.18	2.33	.80	2.23	2.02	2
Krimuldas region	2.86	2.37	6.22	.65	1.37	1.22	3.62	2.90	2
Keguma region	3.16	1.81	.41	1.78	1.39	.68	.51	1.98	1
Kekavas region	4.99	3.52	1.17	.76	2.08	1.30	1.85	3.23	3
Lielvardes region	3.02	2.35	.90	1.45	1.79	.77	2.22	2.17	2
Limbazu region	2.67	2.89	.24	1.50	2.63	.70	3.57	2.15	2
Malpils region	3.04	4.02	2.91	1.25	1.09	.70	5.50	2.87	2
Marupes region	6.90	5.06	.49	.10	3.11	1.04	1.22	4.19	4
Ogres region	4.00	4.89	.34	1.09	2.64	4.54	3.64	3.25	3
Olaines region	3.68	-.58	.39	1.66	4.17	.87	1.05	1.95	1
Ropazu region	3.68	1.76	.60	.42	1.77	.55	1.35	2.17	2
Salacgrivas region	2.91	2.01	3.77	1.28	1.88	.80	1.67	2.47	2
Salaspils region	3.89	2.33	1.49	1.45	2.00	1.23	1.17	2.61	2
Saulkrastu region	5.30	5.01	.08	1.93	3.26	.52	1.43	3.58	3
Sejas region	3.46	2.23	.00	1.24	3.17	.46	4.82	2.36	2
Siguldas region	3.54	2.67	2.28	2.78	3.33	.35	1.50	2.80	2
Stopinu region	5.07	7.24	.54	.53	5.09	1.03	4.02	4.14	4
Tukuma region	2.84	2.61	.23	2.18	2.05	.95	1.64	2.10	2
Kurzeme	2.76	2.83	0.82	1.35	2.62	0.87	1.51	2.18	
Liepaja	3.00	3.05	.83	7.53	3.02	.25	1.11	2.73	2
Ventspils	4.26	3.52	.54	3.24	4.00	.30	2.35	3.11	3
Aizputes region	2.27	2.72	.11	.85	4.54	.42	1.04	1.90	1

Alsungas region	2.55	2.05	.02	.42	.93	.63	2.09	1.65	1
Brocenu region	2.74	2.48	.00	1.39	1.45	.50	0	1.82	1
Dundagas region	2.61	2.04	.64	1.05	2.16	2.57	2.21	2.00	2
Durbes region	2.83	2.39	.30	1.32	2.28	1.07	1.59	2.03	2
Grobinas region	2.82	2.30	.01	.82	2.53	.87	.85	1.91	1
Kuldigas region	2.30	3.05	.22	1.50	3.45	.55	1.60	1.99	1
Mersarga region	3.26	2.33	.68	.31	2.82	1.00	.57	2.17	2
Nicas region	2.87	2.75	.62	1.53	2.04	.85	.14	2.09	2
Pavilostas region	3.15	2.25	3.92	1.03	3.67	.67	2.88	2.79	2
Priekules region	2.11	3.29	.37	.66	1.77	.75	1.72	1.82	1
Rojas region	2.91	1.52	2.98	.64	.89	.61	1.91	2.15	2
Rucavas region	3.03	1.92	1.11	.26	2.72	.83	1.58	2.09	2
Saldus region	2.74	3.05	.01	1.21	1.88	.73	1.74	2.03	2
Skrundas region	2.16	4.45	.10	.91	3.29	.79	1.51	2.14	2
Talsu region	2.56	2.88	1.58	1.63	2.09	1.28	1.50	2.22	2
Vainodes region	2.11	4.84	1.68	.23	2.69	1.31	2.34	2.40	2
Ventspils region	2.94	3.80	.71	.53	4.22	1.34	1.40	2.49	2
Vidzeme	2.50	3.01	0.83	1.33	2.2	1.06	1.63	2.09	
Valmiera	3.50	3.30	.52	2.18	2.60	.74	3.73	2.66	2
Aluksnes region	2.14	3.21	.96	3.86	1.58	.71	1.87	2.12	2
Amatas region	2.99	3.74	.16	.17	2.19	1.73	.80	2.24	2
Apes region	2.29	3.90	.84	.73	.52	1.31	.89	2.00	2
Beverinas region	2.95	1.70	1.42	.57	1.84	.79	1.03	1.99	1
Burtnieku region	2.80	1.25	0	.34	2.89	3.04	1.03	1.81	1
Cesu region	3.18	4.60	0	6.14	1.79	1.24	2.73	2.91	2
Cesvaines region	1.99	3.38	.81	1.61	1.02	1.15	1.22	1.87	1
Erglu region	2.01	2.36	0	.76	1.65	.19	1.29	1.50	1
Gulbenes region	2.42	3.19	.99	1.71	6.26	.79	3.73	2.49	2
Jaunpiebalgas region	2.23	2.65	3.49	1.26	1.69	.46	.59	2.19	2
Kocenu region	2.48	3.56	1.44	1.19	3.16	.63	4.31	2.42	2
Ligatnes region	2.62	2.78	.56	.76	2.24	.67	2.61	2.04	2
Lubanas region	2.24	1.89	.64	1.08	1.41	.71	.06	1.59	1
Madonas region	2.22	2.59	.93	1.08	1.83	.66	1.97	1.86	1
Mazsalacas region	2.31	2.12	1.61	1.52	3.43	.63	1.16	2.02	2
Nauksenu region	2.96	2.38	0	.49	2.92	3.96	1.60	2.17	2
Pargaujas region	2.79	2.79	1.14	.65	2.62	1.89	1.37	2.22	2
Priekulu region	2.67	3.40	.47	.41	1.84	.73	.61	2.03	2
Raunas region	2.38	2.37	0	.72	1.63	.29	.65	1.63	1
Rujienas region	2.30	2.94	.22	.69	1.22	.89	2.26	1.80	1
Smiltenes region	2.76	2.39	2.66	2.31	2.50	.84	1.35	2.42	2
Strencu region	2.27	6.87	.90	.26	1.79	.83	1.74	2.63	2
Valkas region	2.30	3.55	1.03	2.08	2.18	.62	1.02	2.14	2
Varaklanu region	1.86	2.14	.58	.64	1.31	.55	1.18	1.47	1
Vecpiebalgas region	2.41	3.33	.26	1.38	3.19	1.39	1.49	2.11	2
Zemgale	2.7	2.95	0.49	0.91	2.23	1.48	1.87	2.11	
Jelgava	3.66	2.58	.23	2.04	3.00	1.00	1.34	2.48	2
Jekabpils	2.43	1.83	1.04	2.26	2.51	.47	.96	1.90	1
Aizkraukles region	2.95	2.89	.06	2.51	5.39	.40	3.54	2.48	2
Aknistes region	2.29	2.36	0	.43	2.70	.59	1.65	1.70	1

Auses region	2.49	1.96	1.35	.23	2.82	.77	1.33	1.90	1
Bauskas region	2.87	3.57	0	1.65	1.42	2.77	1.28	2.26	2
Dobeles region	2.96	2.68	.50	1.01	1.94	.73	1.51	2.10	2
Iecavas region	3.01	2.99	.44	.76	3.11	.36	.58	2.18	2
Jaunjelgavas region	2.51	4.70	.03	.35	2.78	1.59	.99	2.26	2
Jekabpils region	2.34	2.19	.12	1.09	2.93	1.46	1.92	1.83	1
Jelgavas region	3.20	2.41	.54	.95	.80	1.35	2.20	2.13	2
Kokneses region	2.52	5.17	.10	1.10	3.25	1.69	5.32	2.63	2
Krustpils region	2.31	4.18	.01	.47	2.57	1.79	1.74	2.11	1
Neretas region	2.33	2.33	.86	.24	1.95	1.31	1.81	1.82	1
Ozolnieku region	3.61	3.03	.09	.42	1.94	.52	3.39	2.40	3
Plavīnu region	2.30	1.88	.42	.64	1.26	2.09	.75	1.63	1
Rundāles region	2.82	3.70	.36	.44	.95	7.51	2.43	2.48	2
Salas region	2.01	3.33	.71	.60	1.38	1.20	1.39	1.82	1
Skriveru region	2.66	2.81	1.71	.51	2.69	.63	1.99	2.22	2
Tervetes region	3.06	3.70	.97	.43	.74	2.13	2.89	2.41	2
Vecumnieku region	2.78	2.47	1.22	.76	1.01	1.16	1.51	2.03	2
Viesītes region	2.28	2.10	0	1.15	1.89	1.09	.63	1.63	1
Latgale	1.43	2.74	1.20	0.99	3.27	1.08	1.30	1.69	
Daugavpils	2.48	1.58	.50	1.32	2.69	.67	1.86	1.78	1
Rezekne	2.04	2.56	.07	3.42	3.42	.83	1.64	1.92	1
Aglonas region	.62	4.56	1.07	.28	2.93	.13	1.18	1.56	1
Baltinavas region	1.16	4.75	.05	2.25	5.00	2.48	.86	2.05	2
Balvu region	1.66	3.65	.26	1.53	2.53	1.17	2.56	1.86	1
Ciblas region	.97	2.42	.03	.55	2.19	1.94	.52	1.17	1
Dagdas region	1.34	2.89	.04	1.20	6.18	.83	1.90	1.74	1
Daugavpils region	1.64	3.11	.14	.47	4.48	2.14	2.42	1.84	1
Ilūkstes region	2.14	2.28	.48	1.01	2.21	.87	2.06	1.73	1
Karsavas region	1.26	1.96	6.44	.81	4.65	2.60	.97	2.40	2
Kraslavas region	1.57	2.29	.19	.88	1.98	1.01	1.21	1.41	1
Līvanu region	1.60	2.89	.56	1.47	2.69	.63	.95	1.65	1
Ludzas region	1.32	2.44	.14	1.49	3.62	.85	1.30	1.48	1
Preiļu region	1.96	2.75	.58	1.37	1.23	1.31	.84	1.69	1
Rezeknes region	1.13	3.41	.70	.65	4.57	1.03	1.21	1.68	1
Reibīnu region	1.18	2.39	0	.37	.65	.42	.78	1.06	1
Rugāju region	1.53	2.94	.19	.74	3.91	.95	1.30	1.64	1
Varkavas region	1.47	1.25	.44	.28	3.23	.47	.27	1.18	1
Vilakas region	1.30	2.41	.32	.66	.90	.93	2.63	1.30	1
Vīlanu region	.91	2.86	13.03	.08	5.28	.57	.38	3.29	3
Zilupes region	.84	2.21	0	.14	4.32	.78	.40	1.13	1

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