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METHODS OF SELECTING INDICATORS FOR COMPREHENSIVE ASSESSMENT THE SOCIO-ECONOMIC DEVELOPMENT OF REGIONS

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ABSTRACT **DOI No: 10.36713/epra14549** **Article DOI: https://doi.org/10.36713/epra14549**

In the article, proposals and recommendations on the selection and formation of a set of indicators that allow for the implementation of comprehensive assessments of the socio-economic development of the regions are developed and scientifically based.

KEYWORDS: ***Socio-economic development of regions, statistical research, factors, compatibility coefficient, correlation coefficient, regression analysis, arithmetic mean, "expert" method.***

INTRODUCTION

In the context of growing competition in the process of globalization and uncertainties in the world, especially the uncertainties related to the further development of the after "COVID-19" pandemic, it is a sign that the prospects for the development of the world economy will remain abstract. This, in turn, shows the growing disparity in per capita income between countries, including their regions, and encourages effective regional policies aimed at eliminating disparities in sustainable economic growth.

Therefore, in world practice, extensive scientific research is being conducted aimed at studying and solving the problems of disparities in the sustainable economic growth of regions and elimination of differences in development.

At this point, important information about these factors in the development of the region cannot be directly measured due to their qualitative nature, therefore, taking into account the lack of data to assess the socio-economic situation in the region, it is necessary to conduct statistical research based on new approaches. In this, the most important thing is that, based on the purpose of the research, there is a need to form the necessary indicators in the process of statistical research of the socio-economic development of the regions.

LITERATURE REVIEW

Adam Senetra, Patrycja Szarek-Iwaniuk, Socio-economic development of small towns in the Polish Cittaslow Network — A case study". The main factors affecting the growth potential and socio-economic development of regional units are justified.

Andrew Woodhouse, “Social capital and economic development in regional Australia: A case study”. In his research, he noted that a high level of social capital within a small regional community has a positive effect on the level of economic development and, importantly, provided empirical evidence to support the view of networks of economic development in the Australian context.

Małgorzata Dudzińskaa, Stanisław Baciorb, Barbara Prusc, “Considering the level of socio-economic development of rural areas in the context of infrastructural and traditional consolidations in Poland”. It offers a set of 18 indicators for a

comprehensive assessment of the socio-economic development of Polish regions.

Teemu Makkonen, “Innovation and regional socio-economic development – evidence from the finnish local administrative units”. It offers a total of 21 indicators, divided into social and economic blocs, for a comprehensive assessment of the socio-economic development of Finnish regions.

Glinsky V.V. Serga L.K., Pulyaevskaya V.L. Statisticheskiy instrumentarii v reshinii zadach upravleniya razvitiem territoriy. It offers a set of 14 indicators for a comprehensive assessment of the socio-economic development of regions.

Khudoykulova H.B. "Econometric and statistical study of socio-economic development trends of regions of the Republic of Uzbekistan". In it, a composite index was developed to determine the state of socio-economic development of regions and districts and cities within them; regions are classified into cluster groups according to the characteristics of socio-economic development and divided into 5 levels of development and 6 clusters.

Orlov A.I. Ekspertnye otsenki. //Zavodskaya laboratory. Expert evaluations are one of the detailed tutorials covered.

RESEARCH METHODOLOGY FOR SELECTING INDICATORS USING THE EXPERT METHOD

Based on the study of national and international experiences, in the process of statistical research of socio-economic development of regions, it is suggested to use the expert method in determining the necessary indicators based on the purpose of the research [9].

Let's consider the proposed method in detail. First, based on the purpose of our research, we formed a group of experts consisting of a total of 20 people. Next, based on national and foreign experiences, a set of indicators was formed and presented to experts.

For this purpose, within the framework of research, 50 approved by the Decree of the President of the Republic of Uzbekistan No. 4702, 24 approved by Decree No. 287, as well as 18 Polish scientists, 21 Finnish scientists recommended in their scientific work to assess the state of socio-economic development of the regions and 14 sets of indicators of Russian scientists were summarized [1,2,7,8,10].

That is, according to directions, a total of 13 in the "Indicators of Economic Development and Efficiency" block, 9 in the "Indicators of Labor Market Efficiency" block, 12 in the "Indicators of Universality and Quality of Services in the Social Sector" block, 5 in the "Indicators of Development and Universality of Infrastructure" block, 6 in the "Competitiveness and Diversification Indicators of the Economy" block, 7 in the "Business Environment and Entrepreneurship Development Quality Indicators" block, 4 in the "Financial Independence and Development Indicators of the Banking-Financial Sector" block, "Efficiency of working with citizens' appeals of local government bodies and 3 sets of indicators were combined in the "data openness indicators" block and 21 sets of indicators in the "Other directions" block.

During the survey, a ranking (rating) is offered based on the assessment sheet of the impact of various factors on the socio-economic status of the region.

In this case, it is evaluated from 0 to 10, and if the expert has difficulty answering, the answer option is 0. The task of the expert is to evaluate each of the considered factors of the socio-economic development of the region in accordance with the expert's assumptions about its importance and probability of occurrence.

After each of the experts fills out the questionnaire individually, the analysis and processing of expert assessments is carried out.

In order to determine the most important factors influencing the highest value of the resulting level for each factor, the overall level was determined as the sum of all experts' assessments of this group of factors.

It is proposed to use the methods of mathematical statistics theory to process the data obtained as a result of the survey of experts.

Expert estimates are averaged by calculating the arithmetic mean value for each impact factor, which is calculated in cases where the average amount of the factor (in this case, expert estimates) is formed as the sum of its values for individual units of the studied total. [8].

$$\overline{x}_i = \frac{\sum_{i=1}^{n} x_{ij}}{n} \qquad (1)$$

Assessment of the appropriateness and consistency of the results of the experts' work is carried out using the coefficient of variation (for each factor of influence) and the coefficient of conformity (for all factors).

The mean square deviation is calculated according to the following formula:

$$\sigma = \sqrt{\frac{\sum(x_y - \overline{x}_i)^2}{m}} \qquad (2)$$

where x_y – the rank assigned to factor i by the j^{th} expert; x – average value of experts' assessment of factor i.

The coefficient of variation is calculated as follows:

$$V = \frac{\sigma}{\overline{x}_i} \times 100 \qquad (3)$$

The compatibility coefficient is calculated according to the following formula:

$$W = \frac{\sigma^2_{\text{факт}}}{\sigma^2_{\text{ҳисобланган}}} \qquad (4)$$

where $\sigma^2_{\text{факт}}$ – the true difference (dispersion) of the general estimates given by experts; $\sigma^2_{\text{ҳисобланган}}$ – the difference (dispersion) of the total estimates if the experts' opinions are completely consistent.

In order to obtain a final score for each factor, experts were asked to evaluate the status and

importance of the factor on a ten-point scale. The experts' opinions were processed in Microsoft Excel.

Initially, the opinions of all experts were grouped and the average factor values were determined to "avoid" the total value of the factors, since each group contains different characteristics under study.

Then, the weight of each study object was determined and the weights were calculated, that is, the sum of the factors for each group of processes was determined and the arithmetic average value of the factors was calculated:

$$\bar{G} = \frac{\sum_{i=1,j=1}^{n,m} G_{i,j}}{m} \qquad (5)$$

where $\overline{G}$ – the arithmetic mean of the factors; i – the factor on which the assessment is made; j – expert who assessed; n – the number of experts who assessed; m – the number of indicators in each studied group.

Based on this formula, we calculate the arithmetic averages of the studied factor groups.

1. Arithmetic average for the "Economic indicators" group:

$$\overline{G_1} = \frac{1490}{9} = 165{,}6$$

2. Arithmetic average for the "Social indicators" group:

$$\overline{G_2} = \frac{1394}{9} = 154{,}9$$

We calculate the sum of squared deviations from the arithmetic mean (S) for each factor:

$$S = G - \sum \sigma \qquad (6)$$

The performed calculations made it possible to obtain the following information:

$S_1 = 153{,}9$

$S_2 = 141{,}5$

Summarizing the obtained results, we calculate the compatibility coefficient using Kendall's formula for each group of factors:

$$W = \frac{12S}{n^2(m^3-m)} \qquad (7)$$

where n – number of experts; m – number of factors.

As a result:

$$W_1 = \frac{12 * 153{,}9}{20^2(9^3-9)} = 0{,}64$$

$$W_2 = \frac{12 * 141{,}5}{20^2(9^3-9)} = 0{,}58$$

Then we calculate the compatibility coefficient for all factors:

$S_{умумий}$ = 135,2, m = 18

$$W = \frac{12 * 135.2}{20^2(18^3-18)} = 0{,}69$$

The value of the compatibility coefficient can vary from 0 to 1. When *W*=0, there is no agreement, that is, there is no correlation between the assessments of different experts. When *W*=1, the opinion of the experts is considered to be completely consistent.

A correlation coefficient of 0.5 or greater is required to make a decision to use expert judgments. That is, if *W*>0.5, it is considered that the actions of experts are more coordinated, the opinions are consistent.

As a result, the processing of expert conclusions using the Microsoft Excel program made it possible to select and rank the factors affecting the socio-economic development of the region in terms of importance. It was concluded that the obtained values of consistency and variation coefficients are sufficiently consistent in all cases, and the results of the survey can serve as a comprehensive assessment of the level of socio-economic development of the regions of Uzbekistan. External and internal factors that have a direct impact are highly valued and have a significant weight, as they mainly have a decisive impact on the integrated indicator that characterizes the socio-economic development of the region. Indirect external factors are usually not as significant as direct internal factors. However, the effects of these factors can be significant and users of the method will need to take them into account in their evaluation and analysis.

As a result of the implemented changes, the following model of the complex indicator was formed to assess the level of socio-economic development of the region:

$$y = x + x_1 + x_2 + x_3 \qquad (8)$$

where y – complex integral indicator of socio-economic development of the region; x – factors affecting and evaluating the socio-economic development of the region.

The next step in the development of a comprehensive assessment of the socio-economic status of the region is to determine the level of effectiveness of the new method in terms of its practical application. We evaluate the significance of the developed model using regression analysis and finding Fisher's criterion. In regression analysis, Fisher's test allows to evaluate the significance of linear regression models. In particular, it is used in stepwise regression to test the feasibility of including or excluding independent variables (factors) from the regression model. In the analysis of variance, Fisher's criterion allows to evaluate the importance of factors and their interaction.

In general, information classifying statistical indicators reflecting the socio-economic development of regions for 2010-2021 was developed according to Table 1 below.

It is divided into two main groups, i.e. groups of indicators representing the economic development and social development of the regions. Both groups include a total of 18 indicators out of 9 (except for the main 2 indicators).

Table 1
Information Classifying the Indicators Reflecting the Socio-Economic Development of the regions of Uzbekistan

Code	Indicator	Unit of Measure	General Level	Average Value	Mean Squared Deviation	Variation Coefficient, %
Indicators Representing Economic Development						
Y	а) Gross regional product	Thousand Soums	178	8,9	1,4	15,9
	б) Local budget revenues per capita	Thousand Soums	175	8,8	1,3	14,4
X_1	Volume of industrial output per capita	Thousand Soums	172	8,6	1,1	12,4
X_2	Volume of agricultural products per capita	Thousand Soums	162	8,1	1,4	17,8
X_3	Volume of services per capita	Thousand Soums	177	8,9	1,0	10,9
X_4	Volume of retail trade turnover per capita	Thousand Soums	165	8,3	1,4	16,7
X_5	The volume of investments per capita	Thousand Soums	159	8,0	1,3	16,6
X_6	Volume of construction works per capita	Thousand Soums	167	8,4	1,0	11,5
X_7	Export volume per capita	Thousand USD	170	8,5	1,3	15,1
X_8	Business scope in the area (active)	unity	154	7,7	2,0	25,3
X_9	Average usable land area per person	m^2/person	164	8,2	1,2	15,2
Indicators Representing Social Development						
S_1	Population	A Thousand People	160	8,0	1,3	16,8
S_2	Population density	Person/M^2	153	7,7	1,4	17,7
S_3	Life expectancy at birth	Year	172	8,6	1,0	11,9
S_4	Nominal average monthly salary	Thousand Soums	139	7,0	1,3	19,0
S_5	Employment rate	%	173	8,7	1,5	17,3
S_6	Net migration balance	Unity	147	7,4	1,7	23,3
S_7	Coverage of preschool education	%	151	7,6	1,7	22,4
S_8	Supply of teachers (including pre-school, general education, academic lyceum and colleges)	To 1000 Students	156	7,8	1,7	21,3
S_9	Medical care (availability of doctors)	Per 1000 Inhabitants	143	7,2	1,8	24,7

In world experience, the Gross Regional Product (GRP) is not only one of the main indicators of the national accounts system, but also an important indicator that fully reflects the state of economic development of a specific region. For this reason, GRP calculated in thousand soms per capita is also included in the proposed system of indicators. GRP, which is the object of our research, is used as the main factor only when the I and II levels are studied, that is, when the territory is studied as a part of the economic space or as an independent object of research. On the other hand, since the gross regional product is not formed by cities and districts, we consider it appropriate to use the indicator of local budget income per capita in researches at the level of III level regions, that is, at the level of cities and districts.

CONCLUSIONS

Therefore, as the main indicator for statistical analyzes at the level of the region, the gross regional product of the Republic of Karakalpakstan, the regions and the city of Tashkent, and the indicators of local budget income per capita at the level of cities and districts are proposed.

All indicators included in the "Indicators representing economic development" block, i.e. the volume of industrial output, the volume of agricultural products, the volume of services, the volume of retail trade, the volume of investments, the volume of

construction works, the volume of exports, the average usable land area are calculated per capita.

The block of indicators representing social development includes the number and density of the population, life expectancy at birth, nominal average monthly wages, employment rate, net migration balance, coverage of preschool education, indicators of provision of teachers and doctors.

Labor resources and their employment, that is, the level of employment, is a sign of the social protection of the population of the region. In our study, we used the employment rate indicator, which in turn is the inverse of the unemployment rate, meaning that a low employment rate means a high unemployment rate.

Pre-school education coverage and teacher supply (including pre-school, general education, academic lyceums and colleges) are key indicators of education, which is a key component of this social sector. At this point, the index of preschool education coverage is used as the main indicator as an indicator of education.

Thus, it is possible to conclude that the opinions of experts in the performed calculations are sufficiently consistent in all cases, and the results of the survey can serve to assess the level of socio-economic development of the region.

REFERENCES

1. *Resolution PQ-4702 of the President of the Republic of Uzbekistan dated May 1, 2020 "Rating of socio-economic development of regions on the introduction of the evaluation system" // https://www.lex.uz/docs/4803531.*
2. *Decree of the President of the Republic of Uzbekistan dated December 30, 2022 No. PF-287 "On measures to classify the regions of the republic into categories and introduce a differentiated system of business support" // https://lex.uz/pdfs/6333225.*
3. *Abhiman Das, Socio-economic development in India: a regional analysis, Development & Society, vol.28, № 2, December 1999, pp. 313-345.*
4. *Adam Senetra, Patrycja Szarek-Iwaniuk, Socio-economic development of small towns in the Polish Cittaslow Network – A case study", "Cities" the international Journal of Urban Policies and Planning, https://doi.org/10.1016/j.cities.2020.102758.*
5. *Alois Kutscherauer, Regional disparities. Disparities in country regional development-concept, theory, identification and assessment–Ostrava 2010-120 pp.*
6. *Andrew Woodhouse, "Social capital and economic development in regional Australia: A case study", Department of Housing, Queensland Government, P.O. Box 690, Brisbane, Qld. 4001, Australia, Journal of Rural Studies 22 (2006) 83–94.*
7. *Glinsky V.V. Serga L.K., Pulyaevskaya V.L. Statistical tools in solving problems of managing the development of territories // Mathematical and statistical methods in analysis. Questions of statistics, 10/2014, p 14-19.*
8. *Małgorzata Dudzińskaa, Stanisław Baciorb, Barbara Prusc, "Considering the level of socio-economic development of rural areas in the context of infrastructural and traditional consolidations in Poland", Land Use Policy Journal, https://doi.org/10.1016/j.landusepol.2018.09.015.*
9. *Orlov A.I. Expert assessments. //Factory laboratory. - 2008. -T. 62. - No. 1. - P. 54-60.*
10. *Teemu Makkonen, "Innovation and regional socio-economic development – evidence from the finnish local administrative units", Bulletin of Geography Socio–Economic Series no. 15/2011, University Of Helsinki, Finland, DOI: http://dx.doi.org/10.2478/v10089-011-0002-0.*
11. *Khudoykulova H.B. "Econometric and statistical study of socio-economic development trends of the regions of the Republic of Uzbekistan" Dissertation abstract written for the PhD degree, 2023.*