

# Assessment of interregional differentiation of socio-economic development (on the example of the regions of Uzbekistan)

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**Abstract.** The article attempts to generalize the theoretical interpretations of the concept of "interregional differentiation", the essence of the theories of regional growth, determining the level of heterogeneity of the socio-economic space of Uzbekistan and the trends of regional development in the republic. The period of implementation of the Strategy of Actions of the Republic of Uzbekistan in five priority areas of development - 2017-2021 was adopted as the main period of the study. The practical significance of the study is to summarize the results of the implementation of the above-mentioned strategy by assessing the interregional differentiation of socio-economic development in the regions of Uzbekistan. The results of the study can be used in the system of strategic decision-making aimed at the sustainable development of the territories of the republic.

## 1 Introduction

The issues of achieving economic and political stability are on the agenda of modern states, for which improving the quality of life of the population is of paramount importance. In turn, it is impossible to achieve an increase in the standard of living without reducing the level of interregional differentiation, characterized by an increase in the gap in the standard of living of the richest and the poorest segments of the population.

In order to determine the factors that have a direct impact on the formation of inequality in the development of territories, let us turn to the origins of the development of regional growth theories, which are represented by three directions: classical (the theory of regional placement), neoclassical and the theory of cumulative growth.

The first of the above-mentioned theories is devoted to the study of the reasons why companies and people choose a certain region. Its adherents were such scientists as J.G. Tyunen, V. Lowndhardt, A. Weber, A. Lesh, etc. In particular, Tunen owns the position according to which agricultural production is located in the form of various belts around the central city. Lowndhardt developed a theory of optimal placement of industrial production in relation to raw materials sources and sales markets.

Neoclassical theory considers regions as production units between which equality can be established. Representatives of this direction are L. Walras, A. Smith, D. Ricardo, E. Heckscher, B. Olin, H. Siebert, etc. The first of the authors belongs to the so-called concept

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of general economic equilibrium. A. Smith and D. Ricardo believed that the development of interregional trade is necessary to overcome the regional imbalance.

Representatives of the theory of cumulative growth (G. Myrdal, A. Hirschman, F. Perrou, P. Pottier, etc.) hypothesized that alignment in the development of territories can be achieved through the development of large enterprises, where savings on production costs are possible. In particular, Hirschman argued that economic growth in the regions does not always occur evenly, while he spoke in favor of such growth, believing that it is he who is an incentive to development [9].

The problems of assessing and reducing the level of interregional differentiation of socio-economic development are devoted to the work of many modern scientists, both from far and near abroad.

The most important directions of the state policy of foreign countries are the implementation of measures aimed at increasing employment, income and productivity, especially in lagging regions, for which large amounts of budget funds are spent. For example, in the United States, during the first decade of the 21st century, about 95 billion US dollars were spent annually on policies aimed at leveling the economic space. On average, about 40 billion euros are spent annually on supporting lagging regions in their economic development and reducing regional inequality in the European Union, which is almost 30 percent of the EU budget [4].

Authors from the near abroad believe that the imbalance of regional development is an inevitable result of objective differences in the geographical location of regions, natural and climatic conditions, availability of natural resources, population density, the nature of localization of labor resources, etc. [5].

Other authors believe that leveling the development of regions can have negative consequences, since it leads depressed regions to a dependent mood, to a weakening of incentives for economic development and a decrease in the competitiveness of regions and the country as a whole. However, too high a level of polarization of regions can create both economic and political problems, and therefore timely assessment of the level of differentiation and the implementation of appropriate public policy measures is important [3, 7].

The main directions of EU policy in order to overcome interregional inequality are measures to promote the equalization of territorial disparities by supporting uncompetitive regions, for which special institutions have been created to assess the level of regional development and develop appropriate measures [8].

Smoothing out the imbalances in the socio-economic development of regions within the country makes it possible to alleviate the problem of inequality among the population, acting as one of the main aspects of ensuring economic and political security, improving the standard of living of people in most states [10].

In world practice, various methods of the indicator system are used to assess the level of regional imbalance. In our opinion, it is advisable to analyze the development of regions based on three groups of indicators (Table 1).

**Table 1.** Indicators for assessing regional development differentiation

<b>Economic</b>	<b>Socio-economic</b>	<b>Ecological and economic</b>
- GRP; - the volume of industrial output; - the volume of output of agricultural products; - investments in fixed assets; - retail trade turnover; - the volume of paid services	- unemployment rate; - real total income per d/n; - indicators of the development of social infrastructure (the number of educational, medical, cultural institutions, etc.).	- the share of profitable enterprises; - local budget revenues; - the volume of emissions of pollutants into the atmosphere; - provision of apartments (houses) with drinking water

Compiled by the author based on: [6]

Let's supplement the second and third groups of indicators of the above table with some socio-economic and demographic indicators: the average monthly pension assigned to pensioners by region, the number of persons receiving pensions and social benefits by region, the provision of apartments (houses) with sewerage by region, the provision of apartments (houses) with natural gas by region, the total area of the housing stock by region, the number of apartments (houses) by region, indicators of urbanization (as the latter, we take the share of the urban population of the region in the total population of the region). The indicator "the share of profitable enterprises" will be replaced by the indicator "the number of newly created enterprises and organizations by region" (in accordance with the available data). The indicator "revenues of local budgets" will have to be abandoned due to the lack of statistical data on the administrative-territorial entities of Uzbekistan.

The disadvantage of many assessment methods is the lack of a normative indicator of the asymmetry of regional development. In this regard, we will first calculate the variation indicators characterizing the degree of dispersion of indicators by region, using the indicators presented in Table 1 for this purpose, then we will determine the indices of the relative position of the regions (1) by the most problematic of them at the end of the study period and on the basis of the latter we will make a rating of the regions by the level of differentiation.

$$I_{r.p.} = (y_i - y_{min}) / (y_{max} - y_{min}), \tag{1}$$

where  $y_i$  - socio-economic indicator for the region.

## 2 Methods

The article uses universal general scientific research methods: retrospective analysis, abstraction, generalization, comparison, as well as economic and statistical research methods - variational analysis, grouping, index method, etc.

## 3 The results of the research

The territory of the Republic of Uzbekistan is divided into fourteen administrative-territorial entities: The Republic of Karakalpakstan, 12 regions and the city of Tashkent. The Strategy of actions on the five priority areas of development of the Republic of Uzbekistan in 2017-2021 as the most important priority of socio-economic policy in Uzbekistan identified improving the quality of life of the population, reducing the level of differentiation of the population by income, increasing employment and real incomes of the population [1].

We will analyze the effectiveness of the measures carried out in 2017-2021 by calculating the coefficients of variation for the groups of indicators presented in Table 1 (Tables 2, 3, 4).

**Table 2.** Coefficients of variation of economic indicators of development of regions of Uzbekistan in 2017-2021, %

№	Indicators	2017	2018	2019	2020	2021
1.	GRP on d/n	46.45	49.49	58.99	66.76	65.37
2.	Development of investments in fixed assets on the d/n regional	71.22	71.15	72.58	69.15	65.40
3.	Production of industrial products at the d/n regional	80.47	85.83	105.14	123.57	116.75
4.	Production of agricultural products in the d/n region (except Tashkent)	24.57	23.93	23.74	25.26	26.28
5.	The volume of services in the d/n regional	108.81	112.44	115.33	117.90	116.90

Compiled by the author according to the Agency for Statistics under the President of the Republic of Uzbekistan [11].

Calculation of coefficients of variation according to basic economic indicators (Table. 2) showed that there is an increased variation in almost all the analyzed indicators, which means the heterogeneity of the socio-economic development of the regions of the republic and, accordingly, different opportunities for access to production, financial resources and economic potential building. The greatest (almost three-fold) differentiation is observed in terms of the volume of services per capita. Agricultural production is distributed evenly across all regions (except the capital).

**Table 3.** Coefficient of variation of socio-economic indicators of regional development of Uzbekistan in 2017-2021, %

№	Indicators	2017	2018	2019	2020	2021
1.	Unemployment rate in the regions	10.82	5.66	5.47	7.78	8.51
2.	Real total incomes in the regions per d/n	33.17	32.55	36.51	35.28	35.03
3.	The number of teaching staff of preschool organizations in the regions on d/n	35.09	28.95	25.14	21.47	20.60
4.	The number of teachers of general education institutions in the regions per d/n	19.70	18.88	18.08	17.92	17.01
5.	The number of teachers of academic lyceums with higher education in the regions per d/n	69.92	80.02	89.52	83.33	74.45
6.	Coverage of children aged 1-6 years by preschool organizations in the regions	53.65	40.53	30.40	26.48	22.27
7.	Number of graduates of higher educational institutions by region per d/n	113.87	108.40	104.18	84.45	92.45
8.	The number of students of the basic doctoral program by region per d/n	186.99	180.98	167.44	177.33	130.77
9.	Number of hospital facilities by region per d/n	31.44	30.57	29.36	25.27	25.19
10.	Number of hospital beds in the regions per d/n	25.62	23.95	31.90	31.69	29.69
11.	Average monthly pension assigned to pensioners by region	13.53	13.72	15.65	15.95	14.32
12.	The number of persons receiving pensions and social benefits by region (per 1000 people))	12.05	11.15	10.40	9.33	8.52
13.	The share of the urban population of the region in the total population of the region	31.38	31.48	31.59	31.57	38.00

Compiled by the author according to the Agency for Statistics under the President of the Republic of Uzbekistan [11].

Due to the analysis of the coefficients of variation of socio-economic indicators of the development of the regions of Uzbekistan (Table. 3), it can be concluded that in this area the opportunities of the regions are distributed relatively evenly, in particular it concerns employment, health and social security. However, critically high polarization of regions is observed in the field of education, especially in terms of university and doctoral studies. In terms of the number of basic doctoral students by region per capita, the variation in 2017 exceeded the standards by almost 6 times, by the end of 2021. it decreased slightly, however, exceeding the uniformity criterion by 4 times. According to the number of graduates of higher educational institutions by region per capita, there is more than a three-fold excess of the permissible value for a homogeneous space, at the beginning of the study period, the asymmetry was 114%, decreasing to 92% by the end of the period. A positive trend is observed in the coverage of children by preschool organizations, as well as in the number of teaching staff of preschool organizations, which can positively affect the growth of human

capital in the regions. According to the indicators of the share of the urban population in the total population of the region, there is a negative trend of the growth of stratification.

Calculation of coefficients of variation of ecological and economic indicators of development of regions of Uzbekistan (Table. 4) showed that the indicators of emissions of pollutants into the atmosphere are the most scattered around the average - according to official statistics, almost half of all emissions fall on the Tashkent region (in 2021, 425 tons out of 909 tons in the republic). At the same time, the volume of emissions into the atmosphere in the whole country over the study period tended to increase by 7-8%. A high level of differentiation is observed in the number of newly created enterprises and organizations by region - the main share of enterprises being created falls on certain regions of the republic (Tashkent, Samarkand and Ferghana regions), as well as in the provision of housing with sewerage - there are regions that are provided with sewerage by only 15% (the Republic of Karakalpakstan) and there are those that are provided with 100% (Tashkent).

**Table 4.** Coefficients of variation of ecological and economic indicators of development of regions of Uzbekistan in 2017-2021, %

№	Indicators	2017	2018	2019	2020	2021
1.	Number of newly created enterprises and organizations by region	73.44	67.37	54.74	41.77	47.42
2.	The volume of emissions of pollutants into the atmosphere	127.72	133.94	143.79	160.33	161.62
3.	Provision of apartments (houses) with drinking water by region	24.78	25.07	25.96	26.75	24.63
4.	Provision of apartments (houses) with sewerage by region	61.41	61.36	59.99	56.52	51.10
5.	Provision of apartments (houses) with natural gas by region	32.03	37.00	36.45	34.70	34.88
6.	The total area of the housing stock by region per capita to participate	22.97	22.66	22.94	22.24	18.01
7.	Number of apartments (houses) by region per capita	12.11	12.38	12.50	13.30	10.62

Compiled by the author according to the Agency for Statistics under the President of the Republic of Uzbekistan [11].

## 4 Analysis

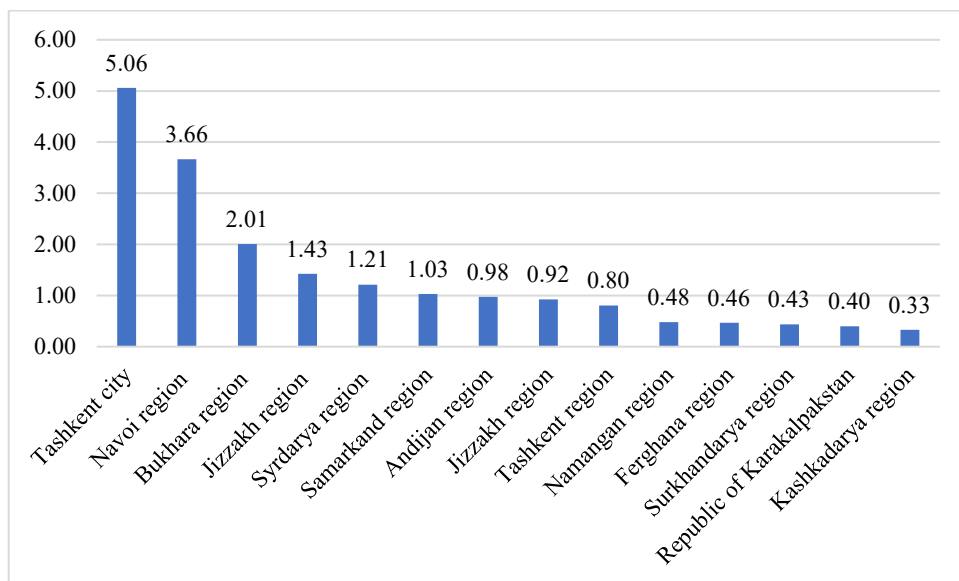
We will analyze the situation of the regions according to individual socio-economic indicators of the development of administrative-territorial units of the Republic of Uzbekistan based on the relative position index (1) (Table 5).

**Table 5.** Indices of the relative position of the regions of Uzbekistan by socio-economic indicators in 2021

№	Region	GRP per capita	Development of investments in fixed assets per capita	Production of industrial products per capita	Production of agricultural products per capita	Volume of services per capita	Number of university graduates per capita	Number of students of basic doctoral studies per capita	Emissions of pollutants into the atmosphere	Summary assessment
1.	Republic of Karakalpakstan	0.05	0.05	0.09	0.00	0.02	0.13	0.13	0.07	0.40
2.	Andijan region	0.05	0.01	0.13	0.42	0.02	0.13	0.22	0.00	0.98
3.	Bukhara region	0.19	0.41	0.12	0.98	0.08	0.12	0.21	0.10	2.01
4.	Jizzakh region	0.12	0.18	0.05	1.00	0.02	0.04	0.01	0.00	1.43
5.	Kashkadarya region	0.04	0.11	0.04	0.30	0.00	0.12	0.03	0.31	0.33
6.	Navoi region	1.00	0.66	1.00	0.97	0.10	0.05	0.04	0.16	3.66
7.	Namangan region	0.02	0.07	0.04	0.19	0.01	0.10	0.10	0.05	0.48
8.	Samarkand region	0.05	0.04	0.05	0.45	0.02	0.20	0.32	0.09	1.03
9.	Surkhandarya region	0.00	0.07	0.00	0.33	0.00	0.04	0.00	0.01	0.43
10.	Syrdarya region	0.14	0.34	0.13	0.62	0.03	0.00	0.06	0.10	1.21
11.	Tashkent region	0.37	0.37	0.38	0.44	0.10	0.05	0.22	1.00	0.92
12.	Ferghana region	0.03	0.00	0.07	0.15	0.02	0.22	0.08	0.10	0.46
13.	Khorezm region	0.06	0.06	0.07	0.48	0.02	0.06	0.06	0.01	0.80
14.	Tashkent	0.69	1.00	0.42	0.00	1.00	1.00	1.00	0.06	5.06

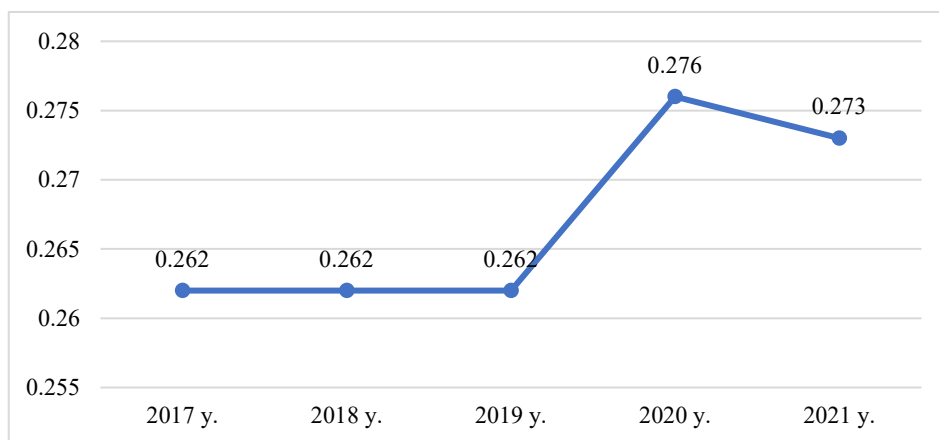
Compiled by the author according to the Agency for Statistics under the President of the Republic of Uzbekistan [11].

To calculate the composite index of the relative position of the regions, all indicators, except for the amount of pollutants released into the atmosphere, were summed up. Since the growth of the latter indicator has a negative impact on regional development, we took it with a minus sign.



**Fig. 1.** Indices of the relative position of the regions of Uzbekistan in 2021.  
 Compiled by the author according to the Agency for Statistics under the President of the Republic of Uzbekistan [11]

Calculations and graphical data (Fig. 5) indicate that by the end of the study period, Tashkent, Navoi and Bukhara regions were in the best relative position. The minimum value of the relative position index is typical for the Kashkadarya region. The relative range of variation exceeds 15, which means that the gap in the socio-economic development of the regions is growing. This assumption is confirmed by the Gini coefficient for the distribution of income of the population of the republic, presented on the official website of the Agency for Statistics (Fig. 2).



**Fig. 2.** Gini coefficient of uneven distribution of income of the population in the Republic of Uzbekistan in 2017-2021.  
 Compiled by the author according to the Agency for Statistics under the President of the Republic of Uzbekistan [11]

Currently, the republic has adopted a Development Strategy for the New Uzbekistan, designed for the period 2022-2026, in which the issue of reducing differentiation as such is

not reflected, measures to achieve a high-quality standard of living are formulated as the need to "strengthen the responsibility of local authorities for the socio-economic development of regions and improving the standard of living of the population [2]. At the same time, practice shows that in order to achieve sustainable economic growth, it is important not only to improve the standard of living of the population, but also to smooth out the imbalances in the quality of life of individual segments of the population, including in the interregional plan. In this regard, we consider it appropriate to include in the list of strategic goals precisely measures to reduce the polarization of the socio-economic development of the regions and ways to achieve them.

## 5 Conclusion

The study showed that during the period of implementation of the Strategy of Actions for the Further Development of the Republic of Uzbekistan (2017-2021), the following changes occurred in the socio-economic development of the regions:

- in terms of GRP, production of industrial products and the volume of services provided - differentiation has increased;
- in terms of mastered investments in fixed assets, production of agricultural products - differentiation has decreased, but remains significantly higher than normal;
- according to the indicators of employment, healthcare, preschool education and social security, the opportunities of the regions are evenly distributed;
- critically high polarization of regions is observed in the field of education, especially in terms of university and doctoral studies;
- according to the indicators of the share of the urban population in the total population of the region, there is a negative trend of stratification growth, which is manifested in a significant increase in the population in the capital due to internal migration processes;
- the most scattered among the ecological and economic indicators are indicators of emissions of pollutants into the atmosphere;
- a high level of differentiation is observed in the number of newly created enterprises and organizations by region, as well as in the provision of housing with sewerage;
- a significant differentiation in the development of the regions of the republic was confirmed by the relative position indices calculated according to the most important socio-economic indicators.

The assessment of the interregional differentiation of the regions of the Republic of Uzbekistan on the basis of socio-economic and environmental indicators allows us to conclude that the regional policy is ineffective, which has led to an increase in the gap between the regions, especially in such indicators as: the development of investments in fixed assets, localization of industrial production and educational institutions, as well as sources of environmental pollution. In order to reduce the imbalances in the development of the regions of Uzbekistan, it is important to develop a set of effective measures aimed at equalizing the capabilities of the regions on the basis of detailed monitoring of the situation, taking into account sectoral, demographic, geographical, climatic, etc. features of the regions.

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