



STATISTICAL ANALYSIS OF SUSTAINABLE DEVELOPMENT OF TERRITORIES IN THE DIGITAL ECONOMY (ON THE EXAMPLE OF KHOREZM REGION)

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Introduction

Economically sustainable development of regions encourages to increase the economic, social, cultural and environmental well-being of vulnerable areas (cities and districts) through the full use of their resources and the potential of its population. Wealth creation through the expansion of sustainable economic development increases the quality of life, which is a necessary condition for regional development.

The indicator that primarily affects the statistical indicators of sustainable development of the regions is the population of these regions, because it is expedient to study changes in the population in order to assess the level of poverty in all areas.

ABSTRACT

In this article, a descriptive analysis of the system of statistical indicators that characterize the sustainable development of the regions, econometric models of the transformation of the sustainable development of the regions into the standard of living of the population, statistical evaluation of the sustainable development of the Khorezm region's economy are studied.

The regions with the highest share in the population of the republic are Samarkand, Fergana, Tashkent and Kashkadarya regions. If we divide the regions into statistical groups on the share of population, according to the data of the beginning of 2006 (January 1):

Group 1: from 2.6 to 5.4 percent - this includes Syrdarya, Navoi and Jizzakh regions;

Group 2: from 5.4 to 8.2% - this includes Khorezm, Bukhara regions, the Republic of Karakalpakstan, Surkhandarya, Namangan regions and the city of Tashkent;

Group 3: from 8.2 to 11.0 percent - this includes Andijan, Kashkadarya, Tashkent, Fergana and Samarkand regions.

According to data from the beginning of 2021 (January 1)



Group 1: 2.5-5.5% - covering Syrdarya, Navoi, Jizzakh and Khorezm regions ;

Group 2: from 5.5 to 8.5% - including the Republic of Karakalpakstan, Bukhara region, Surkhandarya region, Tashkent city and Namangan region ;

Group 3: from 8.5 to 11.4 percent - this includes Tashkent, Andijan, Kashkadarya , Fergana and Samarkand regions.¹

We can say that in comparison with the beginning of 2006, the share of the population of Khorezm region in the beginning of 2021 decreased from the 2nd group

to the 1st group. In other words, the share of the population of Khorezm region in the Republic has not changed (5.5%), and the population growth rate is very low .

The analysis shows that even in large developed countries, population growth is very large, which contributes to the development of the domestic market, expansion of production and an increase in labor resources. Through this, it is possible to determine from the statistics that the Chinese state has reached its current position in the world today. However, it is advisable to increase the internal resources equally. This is because the increase in domestic resources opens up a wide range of opportunities, otherwise the level of poverty in the country may increase. This could lead to an increase in the level of poverty based on the Sustainable Development Goal 1 indicators, i.e. the international assessment of extreme poverty.

In our country, this figure is calculated and published by the State Statistics

Committee. Data on this in recent years can be seen in Figure 1 below.

¹ <https://stat.uz/en/official-statistics/demography-2> (State Statistics Committee of the Republic of Uzbekistan)



Figure 1. Proportion of low-income population in the Republic of Uzbekistan (low-income level)²,%

²Prepared by the author on the basis of data from the State Statistics Committee of the Republic of Uzbekistan.



1 are calculated on the basis of sample observations from the State Statistics Committee of the Republic of Uzbekistan. Accordingly, the share of low-income population in the country decreased from 2005 to 2019, and in 2020 this figure increased by 0.5% compared to 2019. The main reason for this increase was the coronavirus pandemic, during which many enterprises stopped working and lost their jobs, resulting in an increase in the share of the poor in the country. This, in turn, has had an impact on both urban and rural areas, with the figure rising in 2020 in both urban and rural areas. In particular, in urban areas it was 8.4 percent in 2019, 9.0 percent in 2020, and in rural areas it was 13.5 percent in 2019, compared to 13.5 percent in 2019.

The regions with the highest average poverty rate in the analyzed period were the Republic of Karakalpakstan - 31.4%, Kashkadarya region - 26.8%, Surkhandarya region - 23.6% and Syrdarya region - 21.6%. The lowest regions were Tashkent city - 2.8%, Fergana region - 10.8%, Tashkent region - 11.7% and Bukhara region - 13.1%. The variability breadth of the average low-income level between regions was 28.6 percent. This means that there is a huge variation between regions. A clearer and clearer view of this can be seen by calculating the standard deviation, i.e., the variation between regions was 6.7 percent. It is advisable to improve the quality factors in the economy of the regions in order to reduce the variation of the low-income level between the regions and to eliminate the disproportion between them or to reduce it to a minimum.

the Ministry and its affiliated organizations is the clear support and reduction of poverty. development of mechanisms, socio-economic development of the regions and implementation of measures to achieve the goals and objectives of national sustainable development. Restoring strong economic growth and providing employment to the population is certainly a priority, especially during the current coronavirus pandemic.

In the course of our research, we developed econometric models on the impact of sustainable development of the regions on the living standards of the population. In the development of these models, research conducted by international scientists has been studied.

Based on the above, we have selected the following alms in our econometric models.

Y = Poverty rate in countries and regions - $LPP_{C(R)}$

X_1 = GDP growth rate per capita - $PC_{GDP}(GRP)$

X_2 = Population growth rate - $PGR_{C(R)}$

X_3 = Percentage of population receiving old age pension - $PPRP_{C(R)}$

X_4 = Growth rate of gross income per capita - $TIPC_{C(R)}$

X_5 = Employment Rate - $ER_{C(R)}$

X_6 = Unemployment Rate - $UR_{C(R)}$

X_7 = Gini coefficients - $GC_{C(R)}$

X_8 = GDP deflator - $DC(R)$

X_9 = Share of small business and private entrepreneurship in GDP

- $SBPE_{GDP(GRP)}$

mathematical expression representing the functional relationships between the variables of the constructed econometric models

$$Y_{X_{it}} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \dots + \beta_n X_{nt} + \varepsilon_t \quad (1)$$



Based on the theoretical view of this multifactor econometric model, we developed a mathematical expression for the correlation relationship between the selected factors.

$$Y_{X_{it}}(LPP_{C(R)}) = \beta_0 + \beta_1 X_{1t}(PC_{GDP(GRP)}) + \beta_2 X_{2t}(PGR_{C(R)}) + \beta_3 X_{3t}(PPRP_{C(R)}) + \beta_4 X_{4t}(TIPC_{C(R)}) + \beta_5 X_{5t}(ER_{C(R)}) + \beta_6 X_{6t}(UR_{C(R)}) + \beta_8 X_{8t}(D_{C(R)}) + \beta_9 X_{9t}(SBPE_{GDP(GRP)}) + \varepsilon_t(2)$$

We place the statistical data of the variables in the table in the table and evaluate their reliability. The analysis of the descriptive statistical indicators of the

reliable factors listed above is shown in Table 1.

the correlation correlation between the factors, the correlation of factors X_3 (PPRP_C) and X_5 (ER_C) with other factors seemed stronger than the correlation with the outcome indicator, i.e., the presence of a multicollinearity event was confirmed in the correlation table. Therefore, weakly bound factors were excluded.

$$Y_{X_i}(LPP_C) = 0,454X_1(PC_C) + 0,067X_4(TIPC_C) - 0,542X_6(UR_C) - 0,400X_9(SBPE_GDP) - 5,08 \quad (3)$$

Table 1
Descriptive statistics³

Indicators	LPP _C	PC _{GDP}	PGR _C	PPRP _C	TIPC _C	ER _C	UR _C	D _C	SBPE _{GDP}
Average	19.0	104.5	101.6	7.4	126.6	67.7	4.2	19.0	104.5
Median	17.7	104.7	101.5	7.4	124.8	67.7	5.0	17.7	104.7
Minimum	11.0	99.8	101.1	7.0	112.7	66.1	0.2	11.0	99.8
Maximum	28.9	107.9	104.0	8.2	155.8	69.4	10.5	28.9	107.9
Standard deviation	6.5	1.9	0.6	0.3	11.8	0.9	3.2	6.5	1.9
Variation	0.34 ₃	0.018	0.006	0.044	0.093	0.01 ₃	0.76 ₅	0.34 ₃	0.018
Asymmetry	0.16 ₉	-0.413	3,090	1,091	0.968	0.13 ₃	0.19 ₇	0.16 ₉	-0.413
Excess	- 1,61 6	0.075	10,18 ₃	0.777	0.257	- 0,11 2	- 0,76 8	- 1,61 6	0.075
5% Percent	11.0	100.0	101.1	7.0	112.8	66.1	0.2	11.0	100.0
95% Percent	28.8	107.9	103.8	8.2	155.2	69.4	10.4	28.8	107.9
Range	13.4	3.0	0.4	0.3	15.5	1.0	4.9	13.4	3.0

³ Developed by the author on the basis of data from the State Statistics Committee of the Republic of Uzbekistan



Conclusion. This econometric model (3) can be analyzed as follows, with the aim of reducing the resulting mark, since the goal of statistical research is also exactly what factors should be considered to reduce the level of poverty. Therefore, we analyze as follows:

If the GDP growth rate per capita increases by one unit, the poverty rate will decrease by 0.454 units, while other factors will not change. An increase in the rate of growth of gross per capita income by one unit reduces the level of poverty in the country by 0.067 units, even in this case when the remaining factor signs remain unchanged. A decrease in the unemployment rate in the country by one unit will lead to a decrease in the poverty rate by 0.542 units. The increase in the share of small business and private entrepreneurship in GDP by one unit led to a decrease in the level of poverty in the country by 0.400 units.

As a result of this research, reliable econometric models have been developed for each region. Statistical programs such as STATA, MINITAB, Microsoft Excel, EViews and GRETl were used to build these models.

1. Republic of Karakalpakstan:

$$\begin{aligned} Y_{X_i}(LPP_R) = & -5,36X_2(PGR_R) \\ & - 17,85X_3(PPRP_R) \\ & - 1,35X_9(SBPE_{GRP}) \\ & + 768,98 \end{aligned}$$

2. Andijan region:

$$\begin{aligned} Y_{X_i}(LPP_R) = & 3,96X_3(PPRP_R) \\ & - 1,02X_6(UR_R) \\ & - 0,42X_9(SBPE_{GRP}) + 18,56 \end{aligned}$$

3. Bukhara region:

$$\begin{aligned} Y_{X_i}(LPP_R) = & -0,53X_6(UR_R) \\ & - 0,33X_9(SBPE_{GRP}) + 38,65 \end{aligned}$$

4. Jizzakh region:

$$\begin{aligned} Y_{X_i}(LPP_R) = & -0,56X_6(UR_R) \\ & - 0,42X_9(SBPE_{GRP}) + 54,49 \end{aligned}$$

5. Kashkadarya region:

$$\begin{aligned} Y_{X_i}(LPP_R) = & -1,83X_6(UR_R) + 0,17X_8(D_R) \\ & - 0,21X_9(SBPE_{GRP}) + 28,71 \end{aligned}$$

6. Navoi region:

$$\begin{aligned} Y_{X_i}(LPP_R) = & 0,10X_4(TIPC_R) \\ & + 0,89X_5(ER_R) \\ & - 1,05X_6(UR_R) \\ & - 0,13X_9(SBPE_{GRP}) - 50,95 \end{aligned}$$

7. Namangan region:

$$\begin{aligned} \ln Y_{X_i}(LPP_R) = & -1,53\ln X_5(ER_R) \\ & - 2,08\ln X_9(SBPE_{GRP}) \\ & + 18,08 \end{aligned}$$

8. Samarkand region:

$$\begin{aligned} Y_{(X_{t-2})_i}(LPP_R) = & -0,47(X_{t-2})_1(PC_R) \\ & - 0,71(X_{t-2})_6(UR_R) \\ & - 0,4(X_{t-2})_9(SBPE_{GRP}) \\ & + 94,53 \end{aligned}$$

9. Surkhandarya region:

$$\begin{aligned} Y_{X_i}(LPP_R) = & -1,37X_6(UR_R) \\ & - 0,33X_9(SBPE_{GRP}) + 55,08 \end{aligned}$$

10. Syrdarya region:

$$\begin{aligned} Y_{X_i}(LPP_R) = & -6,96X_2(PGR_R) \\ & + 0,13X_4(TIPC_R) \\ & - 0,63X_6(UR_R) \\ & - 0,29X_9(SBPE_{GRP}) - 735,2 \end{aligned}$$

11. Tashkent region:

$$\begin{aligned} Y_{X_i}(LPP_R) = & 0,08X_4(TIPC_R) \\ & - 1,39X_5(ER_R) \\ & - 1,17X_6(UR_R) + 108,14 \end{aligned}$$

12. Fergana region:

$$\begin{aligned} Y_{X_i}(LPP_R) = & 0,46X_6(UR_R) - 0,09X_8(D_R) \\ & - 0,67X_9(SBPE_{GRP}) + 62,58 \end{aligned}$$

13. Khorezm region:

$$\begin{aligned} Y_{X_i}(LPP_R) = & -2,74X_2(PGR_R) \\ & - 0,87X_5(ER_R) \\ & - 0,55X_6(UR_R) \\ & - 0,61X_9(SBPE_{GRP}) \\ & + 399,58 \end{aligned}$$

14. Tashkent city:



$$\begin{aligned} \ln Y_{X_i}(LPP_R) = & 2,79 \ln X_1(PC_R) \\ & - 1,3 \ln X_4(TIPC_R) \\ & - 0,18 \ln X_6(UR_R) \\ & - 6,72 \ln X_9(SBPE_{GRP}) \\ & + 20,93 \end{aligned}$$

As a result of the above research, we can see that the factors affecting the level of poverty in Khorezm region, such as "population growth rate", "employment rate", "unemployment rate" and "share of

small business and private entrepreneurship in GRP" are statistically reliable.

Today, Khorezm region is recognized not only as a region known for its rich cultural and historical heritage, but also for its high-quality fiber cotton, cocoons, sweet fruits, craftsmen, athletes, and young people who are conquering the peaks of science.

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