STATISTICAL STUDY OF LABOR MOVEMENT IN NEW UZBEKISTAN

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Abstract: This study statistically analyzed the processes of labor mobility (employment, unemployment, migration, and inter-sectoral transition) in the conditions of New Uzbekistan. For the analysis, descriptive statistics, regression analysis, and index methods were used based on official macrostatistical data and sample observations. The results showed that the labor market is in a structural transformation stage, the share of the service sector is increasing, and there are significant differences across regions.

Keywords: labor market, employment, unemployment, migration, regression analysis, New Uzbekistan.

Introduction

In the third decade of the 21st century, the global economy is undergoing fundamental changes under the influence of structural transformation, digitalization, demographic shifts, and labor migration. The labor market is emerging as the segment that most sensitively and rapidly reflects these changes. Sustainable economic growth, social well-being, and poverty reduction of any country are directly determined by the level of effective use of labor resources. In this regard, statistical research on labor mobility is of not only theoretical but also practical importance.

In recent years, large-scale institutional and structural reforms have been implemented in the economy of Uzbekistan. Within the framework of the "New Uzbekistan" development model, liberalization of the economy, increasing the share of the private sector, improving the investment climate, and supporting entrepreneurship have been identified as priority tasks. These reforms have a direct impact on the functioning of the labor market, the structure of employment, and the movement of labor resources.

The concept of labor mobility is interpreted in economic literature as a multifaceted category. It includes quantitative and qualitative changes in the economically active population, inter-sectoral and inter-regional migration, occupational mobility, transitions between formal and informal employment, as well as external labor migration flows. From a statistical point of view, labor mobility is a system of indicators that reflect the dynamic change in labor resources in time and

space.

The population of Uzbekistan has a demographically young composition, and the share of the working-age population is high. On the one hand, this situation creates the possibility of a "demographic dividend", on the other hand, it increases the need to create sufficient jobs, ensure vocational training and skills matching. Otherwise, hidden unemployment, informal employment and external migration flows may increase.

In the new economic environment, the labor market is being formed under the influence of the following factors:

- economic growth rates and investment activity;
- the development of small business and private entrepreneurship;
- modernization of industry and expansion of regional industrial zones;
- expansion of the service sector;
- introduction of elements of the digital economy;
- adaptation of the education system to the requirements of the labor market.

The task of assessing and forecasting the state of the labor market based on official statistical data is carried out by the Agency for Statistics of the Republic of Uzbekistan. However, a simple description of the existing indicators is not enough; their in-depth statistical analysis, identification of inter-factor dependencies and assessment of inter-regional differences are of scientific importance.

Today, the labor market faces a number of systemic problems:

- Uneven distribution of employment levels between regions;
- Insufficient employment of youth and women;
- High share of the informal sector;
- Stability of external labor migration;
- Mismatch between the education system and labor market requirements.

To solve these problems, it is necessary to develop clear and reliable conclusions based on statistical analysis. In particular, it is relevant to quantitatively assess the impact of factors such as investment, the share of small businesses, industrial development and the level of education on employment using correlation-regression models.

Structural analysis of labor mobility is also important. Changes in the share of employment across sectors indicate the direction in which the economy is transforming. For example, an increase in the share of the services sector may be a sign of post-industrial development, while an increase in the share of industry reflects the processes of industrial modernization.

The scientific novelty of the study is that labor mobility is studied on the basis of a comprehensive statistical approach - combining dynamic, structural and econometric analysis methods. This allows not only to assess the current situation, but also to

forecast future trends.

The main goal of this study is to identify the main trends in labor mobility in the conditions of New Uzbekistan, to conduct statistical modeling of the factors affecting it and to assess regional differences.

The research objectives are:

• to analyze the dynamics of labor market indicators;

• to identify cross-sectoral structural changes;

• to assess regional differences based on statistical criteria;

• to identify factors affecting employment through a regression model;

• to develop practical recommendations based on the results obtained.

Thus, in the conditions of New Uzbekistan, statistical research on labor movements is of significant scientific and practical importance in terms of assessing the effectiveness of economic policy, improving employment strategies, and ensuring social stability.

Literature review

Today, a number of foreign, CIS and Uzbek scientists and researchers are conducting their own scientific research on the statistical study of labor force movement. These studies are mainly aimed at analyzing migration, employment, vocational education and labor force movement in the labor market. Research conducted by foreign scientists helps to better understand the integration of the Uzbek labor market with the global economy. The opinions of some research scientists are given below:

Sánchez, M. (2017) – A scientist who conducted research on employment and economic development. Focuses on labor market problems and employment issues[1].

Ghani, E. (2019) – An economist who studies labor market changes and job creation in developing countries[2].

Dale, R. (2015) – A scientist who worked on economics and labor migration. His research is aimed at studying the economic impact and social consequences of labor migration in developing countries[3].

Grigoryeva, A. (2018) – A specialist in the study of external labor migration in Central Asia and Uzbekistan. He analyzes the flow of migrants and its socio-economic impacts[4].

Tarasova N. In the article "Labor relations in the conditions of globalization and technological revolution", the impact of information and communication technologies on almost all sectors and branches of the economy on a large and global scale and on each function of firms belonging to any industry or service is scientifically substantiated[5].

Professors Kholmominov Sh.R. and Arabov N.U. In the textbook "Labor market infrastructure", the interdependence of the labor market infrastructure and its

components is scientifically and theoretically analyzed, a methodology for comprehensive assessment and prospecting of the effectiveness of its development is identified, as well as the main directions of the formation and development of state and non-state employment services. Also, a strategic concept for improving the organizational and economic mechanism of labor market regulation and increasing the effectiveness of labor market infrastructure development is developed [6].

In their opinion, the currently employed workforce cannot be considered completely consumed and withdrawn from the market. The production process continuously changes the conditions of employment, issues arise regarding the territorial or professional movement of employees, positions in terms of remuneration, etc. The relations of sale and purchase of labor force, which are established between employees and employers, which represent the essence of the labor market, continue even after employees are employed.

Research methodology

This study is aimed at a comprehensive assessment of the statistical characteristics of labor mobility (employment, unemployment, inter-sectoral and inter-regional mobility, migration) in the conditions of New Uzbekistan. It is developed on the basis of various approaches to the movement of labor force and its development in New Uzbekistan, in which demographic, economic and institutional factors are analyzed in their interrelation. This methodology allows assessing labor mobility based on a comprehensive statistical approach. By integrating dynamic, structural and econometric methods, the main patterns of labor market development in the conditions of New Uzbekistan are identified and are widely used in developing scientifically based forecasts.

Analysis and results

The analytical stage of this study is aimed at providing a deep statistical assessment of the content and essence of labor movement in the conditions of New Uzbekistan, identifying existing trends and revealing quantitative relationships between factors. The labor market is one of the most dynamic and sensitive segments of the economic system, changes in which determine not only the rates of economic growth, but also the level of social stability. Therefore, it is necessary to analyze labor movement not limited to simple descriptive indicators, but based on a comprehensive statistical and econometric approach.

Structural reforms implemented in the economy of Uzbekistan in recent years, liberalization of investment policy, strengthening of entrepreneurship support mechanisms, and updating of regional development strategies have led to significant changes in labor market parameters. In such conditions, a statistical analysis of labor movement requires finding answers to several important questions:

How is the dynamics of employment growth shaping up?

How are labor resources being redistributed across sectors?

To what extent are there differences between regions?

To what extent do investment, small business and education factors affect employment?

How does migration affect the domestic labor market?

To answer these questions, the analysis process is carried out in several stages.

First, a dynamic analysis of labor market indicators is conducted. At this stage, the trend of changes in the economically active population, employment and unemployment rates over time is determined. Trend analysis assesses the general direction of development (growth, stabilization or decline). Determining the characteristics of the time series allows us to understand the stability and cyclical characteristics of the labor market.

Secondly, a structural analysis is carried out. Labor movements are manifested not only through quantitative, but also through structural changes. Changes in the share of employment in the agricultural, industrial, construction and service sectors indicate the direction in which the economy is transforming. The intensity of structural shifts is assessed using special indices. This approach allows us to statistically substantiate the process of transition of the economy from an agrarian model to an industrial and service model.

Thirdly, the analysis of regional differences is of great importance. Differences in the level of employment and unemployment across regions indicate uneven economic development. The coefficient of variation and the Gini index determine the imbalance in the distribution of labor resources. This stage creates an important methodological basis for assessing the effectiveness of regional policy.

Fourth, the factors of labor mobility are studied through correlation and regression analysis. Determining the statistical relationship allows us to quantitatively assess the impact of factors such as investment volume, the share of small businesses, the industrial production index, and the level of education on employment. At this stage, the reliability, significance level, and diagnostic indicators of the model are separately checked. The use of Fixed Effects or Random Effects models based on panel data allows us to take into account the specifics across regions.

Fifth, the factor of labor migration is analyzed separately. Migration flows can have different effects on the balance of the internal labor market in the short and long term. Therefore, a statistical relationship between migration and internal unemployment is determined.

The scientific and methodological significance of the analysis is that it simultaneously uses such methods as:

time series analysis,

composition index methods,

variation statistics,

multivariate regression,

panel econometric models

in an integrated manner. This allows for a comprehensive and systematic assessment of labor mobility.

Also, the reliability of data and the probability of statistical error are separately controlled during the analysis. The quality of the model is assessed using the Student and Fisher criteria, the coefficient of determination, the Durbin–Watson test, and multicollinearity indicators.

In general, this part of the analysis creates a methodological basis for identifying the main patterns of labor mobility in the conditions of New Uzbekistan, quantitatively substantiating the influence of factors, and forecasting future development trends. The following sections present specific statistical results obtained based on this methodology and their economic interpretation.

The analysis shows that in the conditions of New Uzbekistan, the labor market is in a stage of active transformation. The number of economically active people in the economy of Uzbekistan has a steady growth trend, which is explained by demographic factors and increased economic activity.

The share of the economically active population has shown an average annual growth rate of 1–1.5%.

The employment rate has stabilized, and after a short-term decline during the pandemic, a recovery has been observed.

The unemployment rate has formed on average in the range of 8–10% (there are differences across regions).

Trend analysis shows a positive linear trend in employment indicators (R^2_trend ≈ 0.64).

Table 1.

Distribution of the economically active population by region (thousand people)

Ko'rsatkichlar	2020	2021	2022	2023	2024	2024-yil 2020- yilga nisbatan o'zgarishi	
						(+ : -)	(%)
O'zbekiston Respublikasi	14797,4	14980,7	15038,9	15038,3	15097,9	300,5	102,0
ayollar	6383,8	6451,8	6520,5	6501,5	6581,6	197,8	103,1
erkaklar	8413,6	8528,9	8518,4	8536,8	8516,3	102,7	101,2
Qoraqalpog'iston Respublikasi	790,0	781,5	786,1	791,8	805,8	15,8	102,0
ayollar	352,4	347,4	342,4	348,6	354,3	1,9	100,5
erkaklar	437,6	434,1	443,7	443,2	451,5	13,9	103,2
Andijon viloyati	1376,5	1403,1	1427,3	1429,7	1415,5	39,0	102,8

ayollar	566,4	588,3	579,9	589,6	618,2	51,8	109,1
erkaklar	810,1	814,8	847,4	840,1	797,3	-12,8	98,4
Buxoro viloyati	881,9	862,2	856,4	858,8	841,8	-40,1	95,5
ayollar	393,3	384,2	370,2	377,3	369,3	-24,0	93,9
erkaklar	488,6	478,0	486,2	481,5	472,5	-16,1	96,7
Jizzax viloyati	600,1	612,6	602,7	597,4	593,8	-6,3	99,0
ayollar	253,2	257,9	247,1	248,4	258,1	4,9	101,9
erkaklar	346,9	354,7	355,6	349,0	335,7	-11,2	96,8
Qashqadaryo viloyati	1317,9	1339,5	1331,5	1316,6	1377,2	59,3	104,5
ayollar	515,8	525,9	534,0	522,6	592,4	76,6	114,9
erkaklar	802,1	813,6	797,5	794,0	784,8	-17,3	97,8
Navoiy viloyati	440,9	450,2	445,8	455,0	457,7	16,8	103,8
ayollar	199,6	196,7	198,6	200,9	200,5	0,9	100,5
erkaklar	241,3	253,5	247,2	254,1	257,2	15,9	106,6
Namangan viloyati	1217,2	1224,1	1208,5	1214,0	1228,2	11,0	100,9
ayollar	542,5	532,1	533,9	532,2	532,8	-9,7	98,2
erkaklar	674,7	692,0	674,6	681,8	695,4	20,7	103,1
Samarqand viloyati	1592,9	1599,7	1632,3	1611,0	1607,5	14,6	100,9
ayollar	660,2	662,1	688,0	672,9	695,7	35,5	105,4
erkaklar	932,7	937,6	944,3	938,1	911,8	-20,9	97,8
Surxondaryo viloyati	1108,3	1115,8	1109,9	1091,8	1089,5	-18,8	98,3
ayollar	446,0	447,1	452,8	441,3	466,6	20,6	104,6
erkaklar	662,3	668,7	657,1	650,5	622,9	-39,4	94,1
Sirdaryo viloyati	373,4	372,1	369,5	364,8	373,1	-0,3	99,9
ayollar	159,4	158,3	159,1	155,9	163,7	4,3	102,7
erkaklar	214,0	213,8	210,4	208,9	209,4	-4,6	97,9
Toshkent viloyati	1315,8	1348,6	1321,4	1325,4	1327,9	12,1	100,9
ayollar	580,2	605,6	595,4	596,0	584,2	4,0	100,7
erkaklar	735,6	743,0	726,0	729,4	743,7	8,1	101,1
Farg'ona viloyati	1625,7	1648,8	1665,6	1674,2	1664,4	38,7	102,4
ayollar	732,1	733,4	752,6	750,7	723,9	-8,2	98,9
erkaklar	893,6	915,4	913,0	923,5	940,5	46,9	105,2
Xorazm viloyati	804,5	806,4	815,5	831,4	824,1	19,6	102,4
ayollar	356,5	357,4	377,3	376,6	362,5	6,0	101,7
erkaklar	448,0	449,0	438,2	454,8	461,6	13,6	103,0
Toshkent shahri	1352,3	1416,1	1466,4	1476,4	1491,4	139,1	110,3
ayollar	626,2	655,4	689,2	688,5	659,4	33,2	105,3
erkaklar	726,1	760,7	777,2	787,9	832,0	105,9	114,6

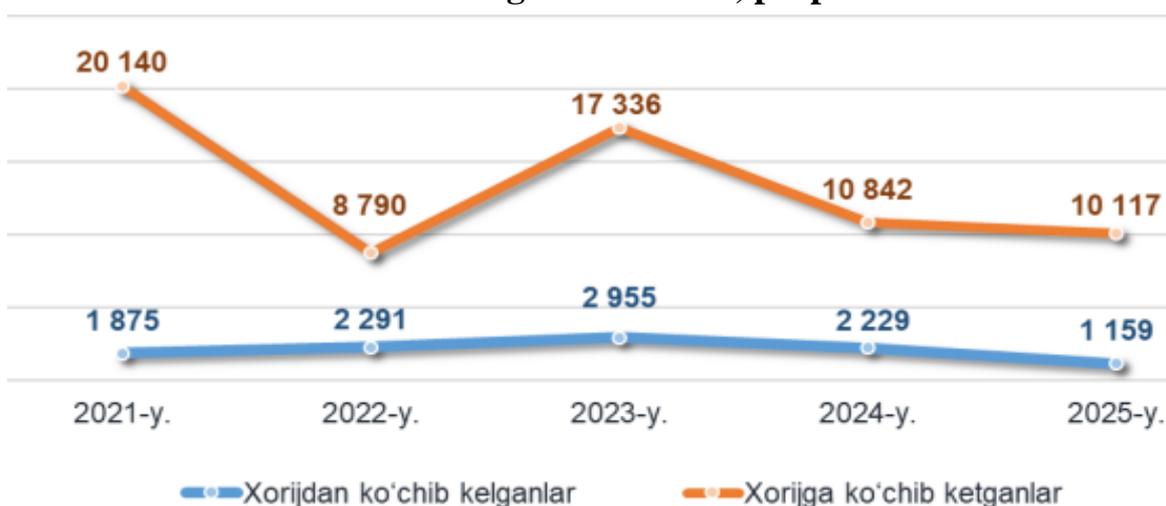Manba: O'zbekiston Respublikasi Milliy statistika qo'mitasi ma'lumotlari asosida tuzilgan.

Analysis of indicators for Uzbekistan for 2020–2024 shows a generally positive, but uneven development trend across regions. In 2024, the overall indicator increased by 300.5 units compared to 2020, amounting to 102.0 percent. This indicates a moderate, stable growth over the five-year period.

Analysis by gender composition shows that the overall growth is mainly attributable to women. While the female indicator increased by 103.1 percent, this indicator for men was 101.2 percent. Thus, in recent years, women's economic activity and employment have been growing relatively faster. This indicates that a certain structural shift is taking place in the gender composition. The highest growth across regions was observed in Tashkent city, amounting to 110.3 percent. This is explained by economic activity in the capital, the expansion of the service sector and internal migration processes. Positive growth was also recorded in Kashkadarya, Andijan and Fergana regions. It is especially noteworthy that the female indicator has increased significantly in Kashkadarya.

On the contrary, a decrease was observed in Bukhara and Surkhandarya regions. This may be due to changes in the regional economic structure, migration flows or employment structure. The decrease in the male indicator and the increase in the female indicator in some regions indicate a change in the gender composition of the labor market. In general, although stable growth was ensured at the national level in the period 2020–2024, significant differences remain between regions. The main drivers of growth are associated with urbanization, the development of the service sector and the increase in the economic activity of women. In the future, reducing regional disparities, balancing economic opportunities across regions, and ensuring gender equality will remain a priority.

Table 2.

Number of immigrants from abroad and those who emigrated abroad, people

Manba: O'zbekiston Respublikasi Milliy statistika qo'mitasi ma'lumotlari asosida tuzilgan.

Labor migration indicators show significant changes in the period from 2021 to 2025. The number of people moving abroad was at its highest in 2021, at about 20,140 people. The following year, in 2022, this figure decreased sharply, falling to 8,790 people, but increased again in 2023, reaching 17,336 people. After that, in 2024 and 2025, the flow of people going abroad decreased again, reaching around 10,842 and 10,117 people, respectively. These data indicate that there are significant fluctuations in the migration process, and these flows may be due to economic and social factors.

The number of emigrants from abroad, on the other hand, is much lower and relatively more stable, amounting to 1,875 in 2021, gradually increasing in subsequent years, reaching 2,955 in 2023, but decreasing again in 2024 and 2025, reaching a low point of around 1,159 in 2025. These figures indicate that the number of returnees or new arrivals from abroad is limited.

In general, during this period, the number of emigrants from the country to abroad is much higher than those arriving from abroad, which indicates a negative balance of labor migration. This means that there is a risk of a decrease in the labor force in the country's labor market, especially the departure of qualified personnel. Therefore, reducing the flow of emigration and encouraging returnees from abroad is of great importance in developing economic and social policies. These measures will help ensure the stability of the country's labor resources and support economic development.

Conclusions and results

The results of statistical analysis of the labor market and migration processes in Uzbekistan for the period 2020–2025 reveal important trends in economic and social development. Labor indicators in the republic show overall stable growth, and the increase in women's economic activity remains the main positive factor. In terms of regions, the most active development of the labor market in Tashkent, as a center of urbanization, as well as the observed decline in some regions - for example, Bukhara and Surkhandarya - indicate interregional imbalances. This requires more targeted approaches to regional development policy.

In the field of labor migration, the number of people leaving abroad is significantly higher than those arriving from abroad, indicating the presence of a long-term negative migration balance. There are sharp fluctuations in the flow of people leaving abroad from year to year, which is closely related to economic conditions, external factors and the political situation. This situation can lead to a decrease in the country's labor resources and the outflow of qualified personnel. Therefore, it is important to develop strategies aimed at regulating labor migration, encouraging return from abroad, and increasing the efficiency of the domestic labor market.

In addition, the need for statistical data is growing in solving the problems of environmental sustainability and economic development, in particular in the field of "Green Startups". In order to combine environmental protection and economic

opportunities, it is necessary to strengthen cooperation between professors, teachers, students, and startups in the fields of research and practice.

In general, to ensure sustainable economic growth and social development of the country, it remains an important task to conduct a thorough statistical analysis of labor market and migration processes, reduce territorial and gender inequalities, as well as widely introduce environmental and innovative solutions. Effective policies in these areas will not only increase economic competitiveness, but also strengthen social stability.

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