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Article

Productive Employment Deficits in Uzbekistan: A Labour-Income-Based Matrix Model, Regional Cluster Analysis, and Implications for Poverty Reduction

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Abstract: This article provides a theoretical and methodological analysis of the relationship between the institutional environment, inclusive factors, and characteristics of regional labor markets when assessing the level of productive employment. It systematizes modern approaches to assessing productive employment, substantiating institutional quality, the ability of social groups to enter the labor market, and economic differences between regions as the main factors influencing its level. The results of the study have scientific and practical significance for improving regional labor policy and inclusive employment strategies.

Keywords: productive employment, institutional environment, inclusive employment, regional labor market, labor productivity

1. Introduction

Amid the digital transformation of the global economy, demographic shifts, and the growing complexity of labour relations, it is no longer sufficient to assess employment solely in quantitative terms. Particular importance is attached to evaluating the level of productive employment among the employed population, namely, employment based on the principles of decent work and characterised by income stability and adequate social protection.

Under the current conditions of global and national economic development, limiting the assessment of employment merely to the number of jobs created or the employment rate is insufficient from both scientific and practical perspectives. Today, labour market efficiency is primarily reflected in the level of labour income earned by employed persons, the amount of their wages, and the potential for sustainable wage growth. In particular, ensuring high labour incomes for the employed population constitutes a key prerequisite for poverty reduction, the strengthening of social stability, and the achievement of sustainable economic growth.

In Uzbekistan, as in many countries worldwide, reforms are being implemented on the basis of legislative and regulatory frameworks aimed at protecting women's labour rights.

In particular, the Uzbekistan–2030 Strategy, approved by Decree No. PF-158 of the President of the Republic of Uzbekistan dated 11 September 2023, "On the Uzbekistan–2030 Strategy," identifies "creating decent conditions for every individual to realise their potential" as a key priority. Goal 27 of the Strategy, entitled "Reducing the Poverty Rate in the Country," encompasses the following three objectives: (1) to halve the poverty rate

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by 2026 compared with its 2022 level and to reduce it drastically by 2030; (2) to increase the incomes of 4.5 million people at risk of falling into poverty; and (3) to train 500,000 qualified specialists through social partnership [1].

Today, the qualitative dimensions of employment are more important for any employed person than whether they are engaged in full-time or part-time employment.

When assessing the level of productive employment, it is appropriate to analyse opportunities for increasing wages and labour income in close interrelation with the institutional framework, inclusive labour market policies, and regional specificities.

Literature Review

Productive employment refers to any activity not prohibited by law through which individuals utilise their productive and creative capacities and earn a guaranteed labour income sufficient to maintain consumption above the national poverty line for themselves and their dependants [1].

The concept of productive employment constitutes one of the principal categories used to assess employment quality in contemporary labour economics. According to the approaches developed by the International Labour Organization, productive employment implies the engagement of labour resources in jobs that generate high value added, provide stable income, ensure high labour productivity, and offer social protection [2], [3]. This definition prioritises not only the quantitative dimension of employment but also its economic and social quality.

Human capital plays a decisive role in the formation of productive employment. Seminal studies on human capital theory have demonstrated that investments in education, vocational training, skills development, and healthcare enhance labour productivity, thereby contributing to wage growth and increasing the likelihood of productive employment [4], [5]. According to this approach, employment quality is directly associated with the knowledge and skills of the workforce.

In neoclassical economic theory, productive employment is explained through the equilibrium between real wages and labour productivity in the labour market. In his works, A. Marshall emphasised that the demand for labour is determined by the marginal productivity of labour, while wages are constrained by the additional value generated in the production process [6]. This approach establishes an intrinsic relationship between productive employment and economic efficiency.

The Keynesian school of economics, however, interprets productive employment not merely as an outcome of market equilibrium but also in relation to the level of effective demand in the economy. According to J. M. Keynes, stimulating economic activity through public investment and fiscal policy can increase not only the number of jobs but also their quality [7]. This approach substantiates the active role of the state in promoting productive employment.

Theories of long-term economic growth examine productive employment in relation to the sustained growth of labour productivity. R. Solow's economic growth model emphasises that technological progress and capital accumulation increase labour productivity, thereby contributing to the expansion of highly productive employment opportunities [8]. This approach interprets productive employment as an outcome of strategic development.

Institutional economics associates productive employment with the quality of labour market institutions. According to the theory developed by D. North, labour legislation, social protection systems, and the degree of formalisation of labour relations determine the types of jobs towards which labour resources are directed [9]. In an environment characterised by weak institutions, informal and low-productivity employment tends to prevail.

In recent years, the concept of productive employment has been enriched by the principles of inclusive growth. Studies conducted by the United Nations and the World Bank emphasise that productive employment should not only contribute to economic growth but also ensure equal access to the labour market for different social groups [10], [11], [14]. This approach is aimed at reducing the incidence of in-work poverty.

Contemporary research also considers digital transformation to be an important factor affecting productive employment. Digital technologies contribute to reducing the number of low-productivity jobs based on routine labour while facilitating the creation of productive employment opportunities that require advanced qualifications and innovative skills [12]. This further increases the importance of human capital and the institutional environment.

Overall, productive employment constitutes the foundation of a healthy economy and society. It extends beyond the mere creation of jobs by ensuring that workers can contribute to economic growth while earning sufficient labour income to maintain an adequate standard of living [13].

Overall, the literature review demonstrates that productive employment results from the interconnected effects of human capital, labour market equilibrium, effective demand, the institutional environment, inclusiveness, and technological transformation [15].

The proposed "Employment-Poverty-Unemployment-Welfare" Matrix Model Based on the Labour Income Criterion facilitates a systematic analysis of labour market conditions using labour income and minimum consumption expenditure as the principal criteria. The model presents the intersection of employment and unemployment statuses with the categories of poverty and welfare, thereby clearly revealing the existence of in-work poverty. According to the model, not all employed persons can be regarded as productively employed, since the per capita labour income of some employed individuals may fall below the minimum consumption expenditure threshold. Conversely, employed persons whose labour income exceeds this threshold are classified as employed persons enjoying economic well-being and constitute the productive employment zone. At the same time, the model indicates that some unemployed persons may also attain a state of economic well-being through transfer income or other sources of income. Overall, the proposed model provides a scientific rationale for assessing employment not merely as a quantitative indicator but also on the basis of income adequacy and social welfare criteria (Figure 1).

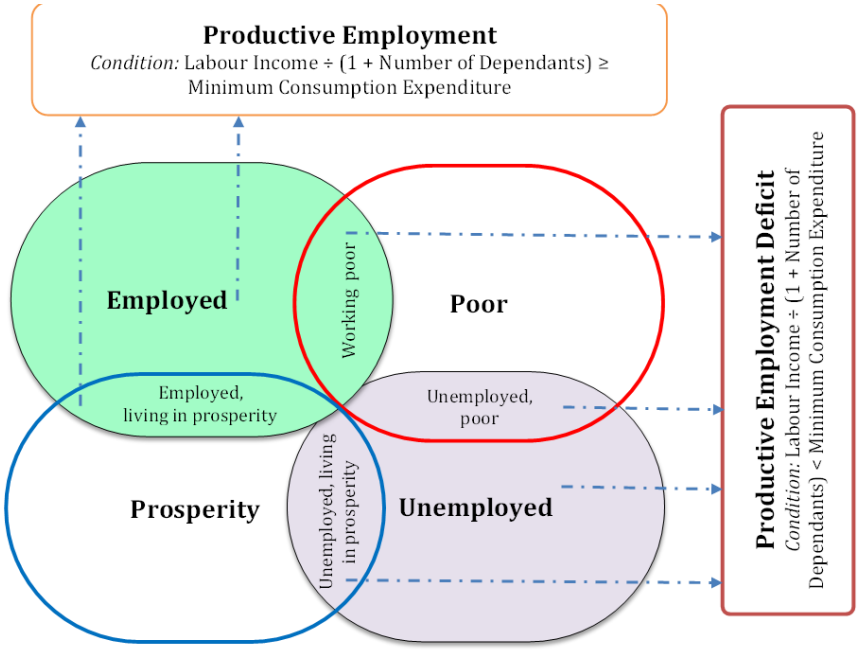

Figure 1. "Employment-Poverty-Unemployment-Welfare" Matrix Model Based on the Labour Income Criterion
Author's own elaboration

2. Materials and Methods

This study, conducted on the basis of the "Employment-Poverty-Unemployment-Welfare" Matrix Model Based on the Labour Income Criterion, examined empirical and conceptual research on productive employment and its gender dimensions available in

scientific sources across several online databases. The scientific approaches presented in these studies were subsequently systematised.

The relevant data covering the period from 2018 to 2023 were collected through social surveys conducted across the 14 regions of Uzbekistan and analysed in conjunction with official statistical data. The years 2019, 2020, 2021, 2022, and 2023 were selected for the cluster analysis to examine changes in regional employment levels. The study also employed the methods of systems analysis, analysis and synthesis, comparative analysis, cluster analysis, monographic analysis, and statistical grouping.

3. Result

In this study, cluster analysis was employed to group the 14 regions of Uzbekistan according to the degree of similarity in their labour market indicators over the period 2019–2023. As a result, the regions were classified into "high," "medium," and "low" clusters, revealing the geographical concentration and persistent recurrence of labour market challenges. The fact that certain regions remained in the high cluster for several consecutive years indicates that these regions are characterised by low employment quality, a high share of informal and low-income jobs, and institutional barriers that constrain the transition to productive employment. Thus, cluster analysis not only statistically demonstrated interregional disparities but also provided an analytical basis for identifying targeted regional policy measures.

Between 2019 and 2023, unemployment indicators generally exhibited a downward trend. Nevertheless, eight regions remained in the high cluster. Tashkent City was the only region to maintain a low unemployment rate for five consecutive years (Table 1).

Table 1. Structure of Regional Clusters by Unemployment Rate, 2019-2023

Cluster	2019	2020	2021	2022	2023
High Unemployment Rate	9.0% – 9.3%	10.4%–11.1%	9.7% – 10.2%	8.8% – 9.4%	7.0% – 7.4%
	Republic of Karakalpakstan, Andijan, Bukhara, Jizzakh, Kashkadarya, Namangan, Samarkand, Surkhandarya, Syrdarya, Tashkent, Fergana, Khorezm	Republic of Karakalpakstan, Andijan, Bukhara, Jizzakh, Kashkadarya, Namangan, Samarkand, Surkhandarya, Syrdarya, Tashkent, Fergana, Khorezm	Republic of Karakalpakstan, Andijan, Bukhara, Kashkadarya, Namangan, Samarkand, Surkhandarya, Syrdarya, Fergana, Khorezm	Republic of Karakalpakstan, Andijan, Bukhara, Jizzakh, Kashkadarya, Namangan, Samarkand, Surkhandarya, Syrdarya, Fergana, Khorezm	Republic of Karakalpakstan, Andijan, Bukhara, Jizzakh, Kashkadarya, Namangan, Samarkand, Surkhandarya, Syrdarya, Tashkent, Fergana, Khorezm
Medium unemployment Rate	8.5%	9.4%	8.8% – 9.5%	8.0% – 8.5%	6.3% – 6.6%
	Navoi	Navoi	Jizzakh, Navoi, Tashkent	Navoi, Tashkent	Navoi
Low unemployment Rate	7.4%	8.0%	7.0%	6.5%	5.4%
	Tashkent city	Tashkent city	Tashkent city	Tashkent city	Tashkent city

Source: Author's own elaboration based on official statistical data

The results of the cluster analysis of productive employment deficits among the economically active population during 2019-2023 revealed substantial interregional disparities. According to the data presented in the table, Andijan, Namangan, Tashkent, Syrdarya and, in certain years, Bukhara remained in the high cluster, indicating an insufficient level of productive employment (Table 2).

Table 2. Structure of Regional Clusters by Productive Employment Deficit among the Economically Active Population, 2019-2023

Cluster	2019	2020	2021	2022	2023
High Level of Productive Employment	24.2% – 24.6%	26.5% – 27.8%	22.6% – 24.4%	22.4% – 23.8%	22.5% – 23.7%
	Syrdarya, Tashkent	Andijan, Bukhara, Namangan, Surkhandarya, Syrdarya, Khorezm	Namangan, Surkhandarya, Tashkent, Fergana, Khorezm	Andijan, Namangan, Surkhandarya, Syrdarya, Tashkent, Khorezm	Andijan, Bukhara, Namangan, Syrdarya, Tashkent
Medium Level of Productive Employment	22.5% – 23.6%	24.9% – 26.4%	21.5% – 22.4%	21.0% – 21.8%	21.3% – 21.9%
	Andijan, Bukhara, Kashkadarya, Namangan, Surkhandarya, Fergana, Khorezm	Republic of Karakalpakstan, Kashkadarya, Samarkand, Tashkent, Fergana, Tashkent City.	Republic of Karakalpakstan, Andijan, Bukhara, Jizzakh, Kashkadarya, Syrdarya	Republic of Karakalpakstan, Bukhara, Jizzakh, Kashkadarya, Samarkand, Fergana, Tashkent City	Republic of Karakalpakstan, Surkhandarya, Fergana, Tashkent City
Low Level of Productive Employment	19.9% – 21.5%	22.7% – 24.1%	20.1% – 20.9%	19.7%	18.8% – 20.5%
	Republic of Karakalpakstan, Jizzakh, Navoi, Samarkand, Tashkent City	Jizzakh, Navoi	Navoi, Samarkand, Tashkent city	Navoi	Jizzakh, Kashkadarya, Navoi, Samarkand, Khorezm

Source: Author's own elaboration based on official statistical data

At the same time, regions such as Navoi, Jizzakh, Kashkadarya, Samarkand, and Khorezm were frequently classified within the low cluster, indicating relatively high levels of productive employment and a comparatively well-functioning labour market. In regions belonging to the medium cluster, the labour market has demonstrated stable development; however, targeted sector-specific reforms are required to achieve its full potential and efficiency.

Although the employment rate among the poor is relatively high, their economic activity is largely confined to low-quality and low-paid jobs. Such jobs are often characterised by low productivity and impede the full development and effective utilisation of human capital.

While cluster analysis provides information on general groups of regions, the regional analysis demonstrates how the level of productive employment in Uzbekistan changed between 2021 and 2024. Nationwide, the share of the productively employed population reached 79.1% in 2021. However, a downward trend was observed in the subsequent period, with the indicator declining to 76.9% in 2023 and 76.1% in 2024. This trend indicates that, despite the growing number of employed persons, the number and share of productively employed individuals have declined.

Table 3. Trends in the Productive Employment Rate in Uzbekistan, 2020-2024 (%)

Regions	2020-yil	2021-yil	2022-yil	2023-yil	2024-yil
Republic of Karakalpakstan	73,8	78,1▲*	77,5 ▼**	75,7 ▼	75,6 ▼
Andijan	74,3	80,1▲	78,3 ▼	76,8 ▼	75,7 ▼
Bukhara	74,5	81,0▲	80,5 ▼	75,4 ▼	75,1 ▼
Jizzakh	77,4	79,2▲	79,9 ▲	80,8 ▼	80,4 ▼
Kashkadarya	74,2	77,7▲	77,9 ▲	78,0 ▲	76,5 ▼
Navoi	78,7	82,1▲	81,3 ▼	80,4 ▼	80,1 ▼
Namangan	72,4	77,8▲	75,5 ▼	73,9 ▼	73,4 ▼
Samarkand	74,3	80,2▲	78,7 ▼	75,4 ▼	75,3 ▼
Surkhandarya	72,8	78,3▲	77,5 ▼	76,7 ▼	74,6 ▼
Syrdarya	71,8	79,6▲	77,7 ▼	74,6 ▼	74,0 ▼
Tashkent	75,4	78,8▲	78,1 ▼	77,4 ▼	75,4 ▼

Regions	2020-yil	2021-yil	2022-yil	2023-yil	2024-yil
Fergana	74,9	79,1▲	78,5 ▼	78,0 ▼	76,9 ▼
Khorezm	73,5	75,8▲	77,6 ▲	79,0 ▲	77,9 ▼
Tashkent City	72,8	78,8▲	76,1 ▼	74,6 ▼	74,4 ▼
Republic of Uzbekistan	**74,3**	**79,1▲**	**78,2 ▼**	**76,9 ▼**	**76,1 ▼**

▲*- Positive change, ▼** - Negative change

Source: Author's own elaboration based on data from the National Statistics Committee of the Republic of Uzbekistan and social surveys conducted between 2020 and 2024.

Between 2020 and 2021, the productive employment rate increased significantly across all regions of the country, with particularly strong growth recorded in Navoi (+3.4%), Bukhara (+3.6%), and Andijan (+5.8%). During this period, economic activity recovered, the services sector expanded, and new jobs were created in the post-pandemic labour market. However, between 2022 and 2023, the indicator declined in almost all regions. For example, it decreased from 77.5% to 75.7% in Karakalpakstan, from 78.7% to 75.4% in Samarkand, and from 77.7% to 76.7% in Surkhandarya (Table 3).

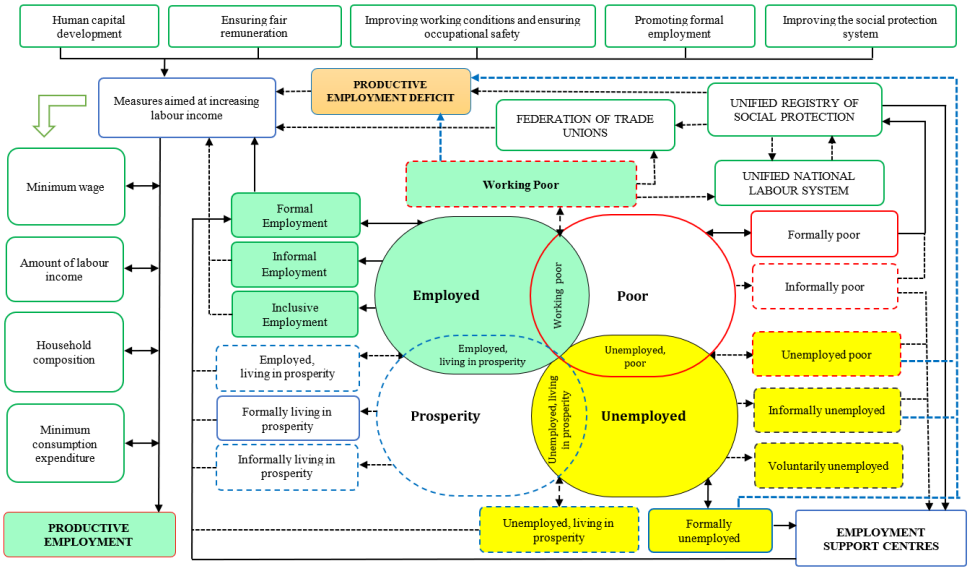

Figure 2. An Integrated Conceptual Model of the Structure of Welfare, Employment, and Unemployment in the Context of Poverty Reduction
Author's own elaboration

4. Discussion

Overall, between 2021 and 2024, the productive employment rate shifted from a phase of growth to one of relative stability and subsequent decline. This trend highlights the need to improve the qualitative dimensions of the labour market, create high-income jobs, systematically strengthen vocational retraining measures, and regularly adjust the wages of private-sector employees in accordance with inflation and income adequacy principles.

At the subsequent stage of the model, institutional mechanisms are activated for groups experiencing a productive employment deficit. The Federation of Trade Unions plays an important role in protecting labour rights and promoting the principle of fair remuneration, while the mechanism for encouraging formal employment is continuously assessed through the Unified National Labour System. The Unified Registry of Social Protection is used to identify employed and unemployed persons among the poor and to

monitor their circumstances on an ongoing basis. Employment support centres facilitate their integration into the labour market through vocational training, retraining, and job placement. In parallel, the implementation of policy measures aimed at developing human capital, improving working conditions, and ensuring fair remuneration contributes to increasing the real incomes of employed persons.

As a result of this continuous process, the working poor gradually transition into the category of employed persons enjoying economic well-being, with their labour income exceeding the minimum consumption expenditure threshold. Thus, at the final stage of the model, employment advances to a qualitatively higher level, resulting in productive employment. Through a feedback mechanism, the outcomes achieved are regularly evaluated, and policy and institutional measures are adjusted accordingly. Consequently, the proposed model functions as an integrated and operational system aimed at reducing poverty, strengthening social protection, and ensuring sustainable, inclusive, and productive employment.

5. Conclusion

The findings of this study demonstrate that, in the contemporary labour market, assessing employment solely in terms of the number of jobs or the employment rate is insufficient. Amid global digital transformation, demographic pressures, and the growing complexity of labour relations, employment quality—particularly the adequacy and stability of labour income and the extent of social protection coverage—has become critically important. From this perspective, productive employment is emerging as a central category for assessing labour market efficiency.

The Employment–Poverty–Unemployment–Welfare Matrix Model Based on the Labour Income Criterion developed in this study systematically revealed the complex interrelationships among employment, poverty, and welfare statuses.

The results of the cluster analysis identified significant regional disparities in unemployment and productive employment deficits across Uzbekistan between 2019 and 2023. Although unemployment declined in certain regions, the persistence of substantial productive employment deficits clearly demonstrated the continuing qualitative challenges within the labour market.

The significant increase in productive employment between 2020 and 2021 can be attributed to the recovery of economic activity and the expansion of the services sector. However, the decline in productive employment observed in almost all regions between 2022 and 2024 indicates that the labour market is facing new qualitative challenges. In particular, although the number of employed persons has continued to increase, the declining share of the productively employed population suggests that the transition towards stable and high-income forms of employment remains slow.

The research findings further demonstrate that, despite the relatively high employment rate among the poor, their economic activity is largely confined to informal, low-productivity, and low-paid jobs. This situation prevents the full realisation of human capital and acts as a factor reducing labour productivity and economic efficiency.

The developed integrated conceptual model demonstrates that the productive employment deficit must be addressed not only through economic measures but also through institutional and social protection mechanisms. Integration among trade unions, the Unified National Labour System, and the Unified Registry of Social Protection was identified as an important institutional foundation for expanding productive employment.

Overall, the findings provide scientific evidence that ensuring productive employment is a fundamental prerequisite for reducing poverty, strengthening social stability, and achieving sustainable economic growth. The proposed model and empirical analyses have significant scientific and practical value for qualitatively reforming Uzbekistan's labour market and promoting inclusive economic growth.

Based on the research findings, the following recommendations were developed:

First, productive employment indicators should be incorporated as mandatory components of the official statistical framework used to assess the labour market. In

particular, alongside the employment rate, the ratio of labour income to minimum consumption expenditure, the proportion of the working poor, and the informal employment rate should be monitored regularly.

Second, the results of cluster analysis should be actively utilised in the formulation of regional labour market policies. In regions characterised by substantial productive employment deficits, targeted regional programmes should be developed to provide vocational training and retraining and to create high-value-added jobs.

Third, to reduce the number of working poor, wage policy must be closely aligned with labour productivity and the subsistence minimum. The minimum wage should be regularly reviewed in accordance with minimum consumption expenditure, while mechanisms for transitioning workers from informal to formal employment should be strengthened.

Fourth, human capital development should be regarded as a key policy priority for expanding productive employment. Programmes supporting education, vocational training, digital skills development, and inclusive employment will contribute to the long-term stability of the labour market.

Fifth, integration between social protection and employment policies should be strengthened. Improving data exchange between the Unified Registry of Social Protection and the Unified National Labour System would accelerate the transition from poverty to productive employment and enhance the efficiency of public resource allocation.

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