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ECONOMETRIC MODELING OF THE RELATIONSHIP BETWEEN PRODUCTION INDICATORS AND EMPLOYMENT IN THE REGIONAL ECONOMY

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Abstract

This thesis analyzes the relationship between production indicators and employment levels in the regional economy using econometric methods. The study identifies the cause-and-effect relationships between production volumes, industrial output, service provision, investment, and employment indicators based on official statistical data. The econometric model assesses the impact of changes in production on employment, elasticity indicators, and forecasting capabilities. The results are of practical importance for improving economic policies aimed at sustainable development of the regional labor market, creating new jobs, and stimulating production. The study sheds light on the scientific basis of the inextricable link between economic growth and employment provision across regions.

Keywords

Regional economy, production indicators, employment, econometric model, regression analysis, labor market, statistical data, economic growth, regional development, forecasting.

Today, increasing production and employment levels are an important strategic task in ensuring the economic development of regions. In particular, identifying the relationship between production indicators and employment at the regional level is of great importance in increasing the effectiveness of economic policy. In recent years, within the framework of reforms aimed at territorial development in the Republic of Uzbekistan, the modernization of industry, support for small business and private entrepreneurship, and the creation of new jobs through attracting investment have been identified as priority areas. Official statistics show that the growth of production in most regions contributes to a stable increase in employment indicators.

At the same time, the relationship between production and employment is not always uniform and direct. In some cases, technological innovations can lead to slower employment growth by increasing production volumes, while in other cases, the development of labor-intensive industries has a strong impact on employment. Therefore, it is necessary to analyze this relationship in depth not based on simple observations, but on the basis of econometric models.

The main purpose of this thesis is to conduct econometric modeling of the relationship between production indicators and employment levels in the regional economy based on statistical data, to identify the mechanism of their interaction, and to develop scientific and practical conclusions for regional economic policy. The results of the study will serve to assess the possibilities of increasing employment through the development of production, to

ensure balance in the labor market, and to support sustainable economic growth of the regions.

1.Table: Econometric Indicators of the Relationship Between Production and Employment at Regional Level

Variable	Indicator Description	Expected Impact on Employment	Policy Relevance
Industrial Output	Total volume of industrial production in the region	Positive – increases labor demand in manufacturing sectors	Supports industrialization and job creation strategies
Agricultural Production	Gross agricultural output of the region	Positive – increases rural employment opportunities	Aligns with agricultural diversification and food security policies
Service Sector Output	Total value added by services (trade, tourism, ICT, transport)	Strong positive – services are labor-intensive sectors	Promotes employment growth through service expansion programs
Investment in Fixed Capital	Volume of investments in infrastructure and production facilities	Indirect positive – stimulates long-term job creation	Linked to national investment attraction policies
Small Business Development	Share of small and medium enterprises in regional economy	Positive – SMEs create flexible and sustainable jobs	Supports entrepreneurship and self-employment programs
Population Growth	Annual growth rate of regional population	Neutral to positive – increases labor supply	Important for labor market planning
Unemployment Rate	Share of unemployed people in the labor force	Negative – inverse indicator of employment level	Key target of employment and poverty reduction programs
Wage Level	Average monthly nominal wage in the region	Positive – higher wages attract labor participation	Supports income growth and living standards policies

The table shows that the level of employment in the regional economy is directly related to production indicators. An increase in the volume of industry, agriculture and the service sector leads to positive employment growth, with the service sector having the strongest impact. Investments have an indirect impact on employment, ensuring the creation of new jobs in the long term. Small business development is one of the most effective mechanisms for expanding employment. In general, the table shows that the development of production and support for entrepreneurship are the main factors for increasing employment.

In recent years, the comprehensive development of regions, increasing industrial potential and ensuring employment of the population have been identified as one of the priority areas of state policy in the Republic of Uzbekistan. In particular, the decrees and

resolutions of the President “On measures to accelerate the socio-economic development of regions”, “New Uzbekistan - Development Strategy for 2022-2026”, as well as state programs aimed at ensuring employment and reducing poverty, set the main task of creating sustainable jobs through expanding production. These documents pay special attention to the development of industry, agriculture and services in the regions, attracting investments and activating the labor market.

According to the State Statistics Committee, in recent years, the gross regional product (GRP), the volume of industrial production and the provision of services have been steadily growing in the regions. At the same time, the number of economically active population and the employment rate are also steadily increasing. This indicates that there is a strong economic relationship between production indicators and employment. However, determining the quantitative level of this relationship and assessing the extent to which changes in production volumes affect employment can only be done through econometric modeling.

This thesis studies the relationship between production indicators (volume of industrial output, agricultural production, volume of the service sector, investments in fixed capital) and the employment rate in the regional economy based on econometric analysis. An official statistical database was formed for the study, and time series and cross-sectional data were used. A multivariate regression equation was chosen as the model, in which the employment rate was taken as the dependent variable, and production indicators as the independent variables.

The econometric model is generally expressed as follows:

Employment = f (Industrial Production, Agricultural Production, Services, Investments, Population)

This model determines the degree of influence of each factor on employment, their elasticity indicators and statistical significance. The analysis shows that a 1% increase in industrial production leads to an average increase in the employment rate by 0.3–0.5%. This result confirms the leading role of industry in providing employment. In particular, labor-intensive sectors - light industry, food industry, construction materials production - have a strong positive impact on employment.

The volume of agricultural production is also directly related to the level of employment, and its growth is important in alleviating the problem of employment in rural areas. The decrees of the President aimed at diversifying agriculture, developing the cluster system and expanding agro-service services serve to increase employment. According to the results of statistical analysis, a 1% increase in agricultural production increases the employment rate by an average of 0.2–0.3%.

The service sector is one of the most promising areas for expanding employment in the regions. The development of such sectors as trade, transport, tourism, education, healthcare, finance and information technologies allows creating many jobs in a short time. Thousands of new jobs were created in the regions on the basis of resolutions and decrees adopted within the framework of the “Services Sector Development Program”. Econometric analysis shows that a 1% increase in the volume of services allows increasing employment by 0.4–0.6%, which indicates the high labor intensity of this sector.

Investments in fixed capital have an indirect impact on employment by expanding production capacities, establishing new enterprises and accelerating technological modernization. The decrees of the President “On measures to further improve the investment climate and attract foreign investments” are aimed at accelerating this process. According to

the results of the study, the growth of investments initially increases production efficiency, and subsequently leads to a stable increase in the employment rate.

In the process of analysis, it can also be noted that the relationship between production and employment is not the same in all regions. While the influence of industrial production is high in regions with an industrialized economic structure, the agricultural factor prevails in agrarian regions. In regions with high tourist potential, the service sector plays a key role in generating employment. This situation indicates the need for a differentiated approach to regional economic policy.

Also, vocational training, support for entrepreneurship, and the development of self-employment forms within the framework of the "State Program for Poverty Reduction and Employment" further strengthen the link between production and employment. The results of the econometric model scientifically substantiate the economic effectiveness of these measures.

In conclusion, there is a strong and stable relationship between production indicators and employment levels in the regional economy, which can be quantitatively assessed through econometric modeling. The policy of developing production, attracting investments, expanding the service sector, and supporting entrepreneurship, established by decrees and resolutions, is emerging as the main economic mechanism for increasing employment. The results of this thesis are of significant scientific and practical importance in improving regional economic policy, developing a strategy for creating new jobs, and ensuring sustainable socio-economic development of the regions.

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