

THE ESSENCE OF ECONOMETRIC MODELING OF LABOR FORCE COMPETITIVENESS IN THE LABOR MARKET

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Abstract: *The article highlights theoretical issues and results of scientific research on the problems of labor competitiveness in the labor market and the prospects for socio-economic indicators of the labor market. The scientific research methodology, forecasting methods used in studying the dynamics of competitiveness in the labor market, features of their application in practice, and the stages of econometric modeling are considered.*

Key words: *labor market, employment, forecasting, competitiveness, econometric modeling*

Introduction

Ensuring employment of the population in market conditions is closely related to the development of modern and effective mechanisms for coordinating the demand and supply of labor in the national labor market and ensuring the employment of surplus labor resources. The Labor Code of the Republic of Uzbekistan, the Law “On Employment”, the Resolution of the President of the Republic of Uzbekistan “On measures to improve and increase the efficiency of work to ensure employment of the population” and other regulatory legal documents form the legal basis for regulating relations in the labor market in the republic.

Since almost half of the population of the Republic of Uzbekistan lives in rural areas, the relatively low level of employment in the regions increases social tension in the labor market. The President of the Republic of Uzbekistan Sh.M. Mirziyoyev adopted a number of resolutions and decrees aimed at improving the standard of living of the population, reducing poverty, preventing unemployment, accelerating the development of private entrepreneurship, home economics and services in the regions of the republic. For example, the Decree of the President of the Republic of Uzbekistan dated July 14, 2018 No. PQ-3856 “On measures to improve and increase the efficiency of work to ensure employment of the population” states that there are a number of problems in increasing employment of the population: “There is still a high level of tension in the labor market in the regions, there are still issues of creating permanent jobs, ensuring employment for youth, women, members of low-income families, as well as regulating the processes of external labor migration... preparing and retraining for professions without taking into account their future needs, their capabilities and resources. As a result, there is a shortage or surplus of qualified personnel in some specialties in the labor market.”

In this sense, the theoretical and methodological study of appropriate and effective methods used in econometric modeling of labor competitiveness in the labor market is relevant. The objectives of the study are to study the approaches of domestic and foreign scientists to determining the parameters of competitiveness in the labor market, grouping methods used in forecasting, developing stages of correlation and regression analysis and their implementation.

Analysis of literature on the topic

In the context of global economic development, scientific works of a number of scientists from independent countries of the Commonwealth are devoted to the issue of competitiveness in the labor market.

N.V. Danilova argues that a number of methods can be used to determine forecast employment indicators: normative, expert assessment, calculation, program, international analogue and extrapolation method. At the same time, in his research, he proposed a methodology for determining indicators of competitiveness in the labor market in a specific area using the extrapolation method [11].

In her research, G. V. Gorelova recommended using a number of scientific research methods in mathematical modeling and forecasting of the labor market, including methods of statistical, expert assessment, cause-and-effect and cognitive analysis, assessing this market as a complex and multifaceted system, and recommended centralized regulatory mechanisms [10].

L.M. Tuktamysheva proposed taking into account periodic fluctuations in indicators on the scale of a separate territory and, in accordance with them, developing management decisions when determining

theregression equation for the immediate state of competitiveness in the labor market,taking into account changes in market indicators of the macroeconomic system [13].

An analysis of the scientific works of domestic scientists devoted to forecasting competitiveness in the labor market shows that in these studies more attention is paid to the use of models in accordance with methods of formalizing their promising parameters based on retrospective statistical data.In particular, in the studies of Sh.R. Kholmuminov, modeling and extrapolation methods for forecasting the labor market are expressed in detail, in which a method for determining promising indicators is proposed, based on segmentation of the object of study by industry and economic sector.This segment of the labor market expresses economic-mathematical and simulation models of changes in the environment under theinfluence of socio-economic factors, regulation of labor supply and demand for it [14].

In the research of N.N. Yuldashev, a practical method for forecasting labor resources on the scale of a separate territory was proposed, which shows the advantages ofcalculating the future population size using the method of age shift of the demographic forecast necessary for calculating the population forecast.working age were reflected [15].

New forms and conditions of economic management, in particular, econometric research into the problems of competitiveness in the labor market and the development of its economic and mathematical model, have not received full andwidespread coverage in scientific works and theoretical views in the area of labor market issues.In particular, there is a need to solve theoretical problems andcomprehensive forecasting of practical aspects of research work aimed at studyingfuture indicators of demand for jobs and employees in local farms.

Research methodology

During the study, methods of a systematic approach, comparison, grouping and correlation regression analysis were used to study the object of study of competitiveness in the labor market. In an econometric study ofcompetitiveness in the labor market, data collected through statistical observation and sociological research are used to form a sufficient information base.According to the long-term indicators obtained as a result of the analysis of these data and econometric assessment, it provides the necessary and sufficiently reliableinformation for the development of scientifically based programs for the socio-economic development of regions, solving social problems and conflicts in the labor market.

Analysis and results

In the last decade, econometrics has rapidly developed as a scientific discipline.The number of studies and articles on the application ofeconometric methods is also increasing.Econometrics is recognized throughout the world by scientists who have carried out famous scientific work in this field: R. Frisch, J. Tinberg, L. Klein, T.Haavelmo, J. It can be recognized that Heckman and D. McFadden were awardedthe Nobel Prize in Economics.

The language of economics is formed in the language of mathematics; economics is often called one of the mathematical sciences. The successes of modern economic science are reflected in new requirements for higher professional education ofeconomists.Director of CEMI RAS, academician V.L. Makarov said that modern economics is based on three main areas: macroeconomics, microeconomics and econometrics.During the period of a centrally planned economy, the main emphasiswas on balance sheet and optimization methods, and with the transition to a market economy, the role of econometric methods increases.

Since labor is one of the main factors of production, the labor market plays an important role in a market economy.The basic concept of any market formation mechanism is supply and demand.If the supply in the labor market consists of labor,then employers are suppliers of demand.Competition between labor demand and supply reflects the competitiveness of the labor market. One of the main tasks of the economy is to create a competitive labor market.Therefore, first of all, it is necessaryto train and retrain competitive personnel.

New conditions and factors of market relations, modern forms of business management and labor relations, wage dynamics, which is considered the main factor regulating supply and demand in the market, competitive conditions forpersonnel training have not been reflected in scientific research on the problems of competitiveness in the labor market.Currently, as a result of radical reform of the entire education system, reorientation of existing educational institutions and thecreation of new educational institutions, primarily vocational schools, business schools and special educational institutions, to train specialists capable of working in new conditions and modern technologies in the marketCompetitive personnel are emerging in Uzbekistan.For this reason, it is necessary to develop a training methodology that meets the new conditions. The main problems that need to be addressed are increasing the demand for labor and reducing its supply,

improving the skills, competitiveness and mobilization of the working population, as well as ensuring its strong social protection.

Solving these problems, in our opinion, includes the following tasks:

- achieving structural changes in the economy;
 - increasing the material interest of employees;
 - improving the activities of educational institutions and employment services;
 - effective use of continuing education, science and production potential to train highly qualified specialists in all types of educational institutions;
 - improving the activities of state and public institutions for career guidance. At the same time, it is necessary to take into account the needs of the market and the possibilities of choosing a profession, so that every person can obtain a suitable profession;
 - the widest possible use of the capabilities of personnel training consumers - enterprises, institutions, firms, joint-stock companies, banks and other structures, primarily to strengthen the material and moral base of secondary vocational schools and higher educational institutions;
- can be successfully solved by implementing "openness" of information about vacancies and similar measures.

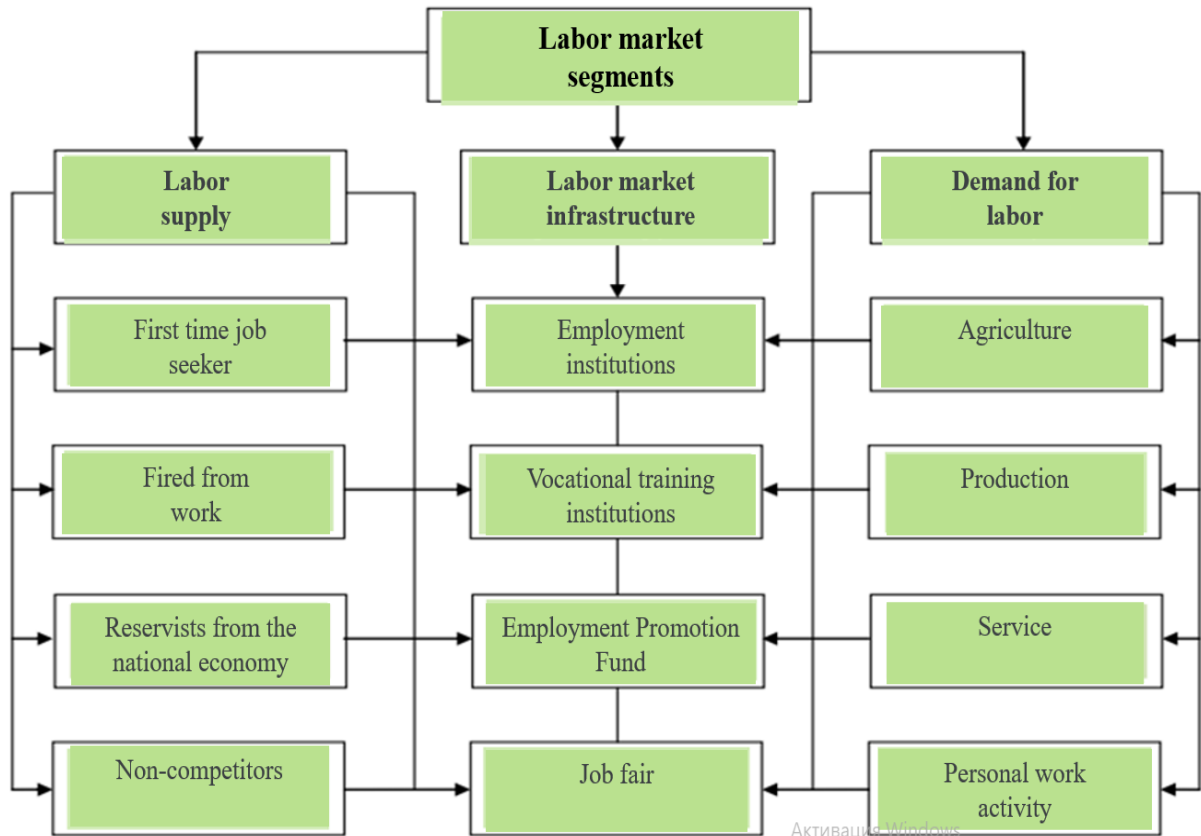
The increase in high-quality competitive specialists in our republic increases the demand for these specialists among employers. Achieving market equilibrium between labor supply and demand leads to reasonable employment of the population. The labor market is a general type of system of socio-economic relations in which labor can be formed, distributed and used as a commodity, which is part of a dynamic system of complex probabilities. The main method for studying such systems is the method of econometric modeling, that is, the method of theoretical and practical processes aimed at creating and using models. At the same time, through models we understand the definition of an existing object (process) expressed in language or the initial appearance of its material form.

Using econometric modeling, it is possible to assess the prospects for increasing competitiveness in the labor market. Competitiveness in the labor market as an object of econometric modeling is a rather complex and new process. The range of specific problems in studying competitiveness in the labor market is very wide; even a description of its full type can become the subject of a separate scientific work. However, the scope of using econometric modeling tools in solving basic problems is considered. As well as econometric models and their effective use.

In the context of the complex, decisive measures to create reasonable employment for the population and reduce unemployment are also important [5].

As a result of econometric modeling, the most optimal options for labor demand and supply, labor competitiveness, the formation of reasonable employment of the population and the reduction of unemployment are determined. They are the main rational indicators of competitiveness in the labor market.

When modeling competitiveness in the labor market, its components can be studied by dividing them into separate segments.



Drawing. Composition of the main labor market segments

When studying the labor market, the method of segmenting its structural structure is described in the scientific works of a number of scientists. However, due to the fact that these studies include only segments of labor demand, it is advisable to study other parts of this market as separate systems.

The labor supply segment is divided into the following components: first-time job seekers, retirees, military reservists, and non-competitive job seekers.

In the segments that make up the labor market, employment institutions, along with government agencies, include entrepreneurs and other entities. The segment of vocational education institutions may include training and retraining institutions, business schools, academic lyceums and vocational colleges, and higher education institutions. Non-governmental organizations that provide employment to the population are part of the Employment Support Fund.

When studying segments of demand in the labor market, we consider it advisable to study all sectors and industrial enterprises in a given region according to their economic characteristics and conditionally divide them into the following four sectors:

1. *Agricultural sector.* This sector embodies all types of farms involved in the cultivation and processing of agricultural products of the estate. This sector includes farms, peasant farms, agricultural enterprises, etc.

2. *Manufacturing sector.* This sector includes all manufacturing enterprises in the state and non-state sectors of the economy, except for agricultural products.

3. *Service sector.* This sector concentrates organizations and institutions serving all enterprises and farms in the region. In particular, these include networks of transport, communications, trade, public catering, public utilities and consumer services, banking, leasing, auditing, information and other service organizations. This sector also includes government bodies, scientific, educational, health and cultural organizations that receive budgetary support.

4. *Sector of personal labor activity.* This sector includes small businesses, private entrepreneurship and households, which form the labor supply in the labor market. Segments of supply and demand of the labor market, production activities of enterprises and farms with different forms of ownership in economic sectors and industries of the region, the entry of foreign investment into this system, the development of a service network and qualitative changes in other areas of entrepreneurship prove that it has a direct impact on social-economic development.

During the current global financial and economic crisis, the competitiveness of highly educated and sufficiently qualified specialists in regional labor markets is increasing due to a decrease in demand for labor at enterprises producing export products in the conditions of Uzbekistan. But the competitiveness of new personnel is not enough. To increase the competitiveness of new personnel in the labor market, it is necessary to increase their availability, self-confidence, and master new ways of searching for work.

In the theory of a market economy, the labor market is the regulation of the demand and supply of labor at an equilibrium price, which puts it on a par with other types. At the same time, this system is inextricably linked with all other market structures. Depending on the quality and quantity of labor in the labor market, its "price," i.e., wages, is determined in the same way as in the market for goods and resources. Consequently, an able-bodied workforce must have quality indicators that determine its price, that is, a combination of physical, mental and professional abilities. Applying these skills to the production process, it must be constantly reproduced so that it does not lose its consumer qualities. Because there will be competition for jobs in this market. Competition in the labor market is the main factor that develops and expands the worker's ability to work. The labor market reflects the dynamics of employment, the main trends in its composition, the flexibility of the labor force, the scale of unemployment and growth rates.

The rapid development of the processes of globalization and economic integration at the world level, the rapid development of information and communication means in its economy is explained by the influence of the results of scientific and technological progress on all areas. The demand for physical and mental labor in the labor market and its supply also change under the influence of new and modern tools, for example, as a result of modernization and automation of production, expansion of information and communication and telecommunication technologies, the Internet, etc., the content of work is constantly changing.

Historical development shows that scientific and technological progress has a significant impact on increasing labor productivity, increasing production volumes, ensuring macroeconomic stability, effective employment of the population and, on this basis, increasing the standard of living of members of society. Today it is extremely important "the use of economic and mathematical methods based on the use of modern electronic computer technology at all levels of economic management..." [6].

Nevertheless, it cannot be denied that there are expert opinions that are skeptical about the achievements of modern science in the scientific interpretation of economic processes and the accurate perspective of macroeconomic indicators. In particular, they quote the opinions of some scientists and their statements in the media in order to present economic events and processes in perspective, to refute its methodology and econometric approaches. Along with a critical analysis of this "evidence."

Here are also opinions justifying the need for econometrics in economic education: "Many people turn to economic forecasting for advice. There is only one problem: the predictability of the future direction of economic development is increasing, the power of computers is increasing, and the collection of information is developing incredibly quickly, but even so the results of these processes are not significant. Economists' average forecasts for economic cycles, especially economic crises and major changes in employment, are at very low levels.

The opinion expressed in *Businessweek* magazine, considered one of the most prestigious media in the United States, confirms that perspective occupies an important place in human society, and when determining indicators of prospectivity, it is difficult to find a more accurate tool than econometric methods and tools. This approach is based on a sophisticated view of the problem, and econometric research is not intended to confirm or refute the patterns of economic development, but to provide an opportunity to obtain advance information about the actual level of the object being studied as a result of a future quantitative change in the factor.

Conclusions and offers

In our opinion, such a difference in the results obtained as a result of forecasting economic indicators can seriously affect the socio-economic situation and development of the country, but does not reduce the importance of research on forecasting economic events. On the contrary, in the current period of rapid development of globalization and integration on a global scale, it is becoming increasingly important to determine trends in economic development on a scientific basis. In particular, the results of a survey conducted by one of the US magazines in 500 large companies in the country confirm that economic and mathematical models and methods are widely used in practice: 98.4 percent - mathematical and statistical analysis, 87.1 percent - simulation modeling, 74.2 percent - network modeling, planning, 74.2% linear programming, 59.7% theory of public service and expectations, 46.8% nonlinear programming, 29.7% dynamic programming [7]. Game theory was mentioned as the least common method (20.6%).

As R. Bacon noted, contempt for mathematics "... for 300 or 400 years destroyed all knowledge among the Latins, while Islamic countries, considered their own "competitors," achieved significant success in the development of science and technology during this period" [8]. Indeed, from the works of oriental scientists Al-Kharizmi, Al-Beruni, Al-Fargani and others, as well as the instruments and devices they created, it is known that mathematics was widely used in various spheres of life in countries where the Islamic religion arose long before the Western Renaissance.

Some economists and specialists, in order to influence the economic system, try to deny the scientific basis and results of forecasting these economic and social indicators, including determining the future parameters of indicators related to the labor market. We believe that it is appropriate to critically evaluate the scientific worldview of the supporters of this trend, citing some opinions.

The achievements of the European Union countries, some countries of Southeast Asia, Japan and other countries that achieved sustainable economic growth in the last decades of the twentieth century confirm that all the critical views of representatives of the Austrian school of economists regarding the rejection of the econometric approach in understanding events and trends are unfounded. During the period of economic fluctuations and changes, good mastery and practical use of mathematical apparatus and methods of mathematical statistics in determining future indicators is considered the *standard of economic education in developed Western countries*.

Modeling competitiveness in the labor market serves as an important source of information when making decisions such as the effective distribution of material, labor and financial resources across sectors and regions of the economy, preventing mass unemployment, which is considered one of the social problems, etc. orientation of the unemployed population and youth. Especially for the Republic of Uzbekistan, where property and structural changes were carried out to regulate market relations in the national economy, these indicators are of great practical importance in regulating the labor market and ensuring its effective functioning.

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