

ABSTRACT

of Ainagul Maratovna Tazhbaeva's dissertation on the topic: “Structural transformations of employment in the context of digitalization of the economy (regional aspect)”, submitted for the degree of Doctor of Philosophy (PhD) in EP 8D04101 “Economics”

Relevance of the research topic. The current stage of socio-economic development is characterized by the deepening of digitalization processes, covering all key areas of public life – from production and management to education, communications and employment. The formation of the digital economy as a new paradigm of economic development is accompanied not only by the introduction of advanced technologies, but also by fundamental changes in the structure of supply and demand in the labor market, the transformation of forms of employment, requirements for professional competencies and mechanisms of interaction between subjects of labor relations. Under these conditions, the study of employment issues becomes particularly relevant, since it reflects the ability of the economy to adapt to technological and institutional changes, ensuring the sustainability of socio-economic development and the growth in the standard of living of the population.

The relevance of the dissertation research topic can be traced in the strategic documents of the Republic of Kazakhstan, which focus on ensuring a decent life for citizens and opportunities for universal labor. In the annual Address to the People of Kazakhstan, the President K. Tokayev outlined the need to form an effective ecosystem on the labor market in regulating social issues of new employment forms in the digital economy. Further directions of skills transformation of labor potential form challenges for sustainable socio-economic development of the country. The Labor Market Development Concept of the Republic of Kazakhstan for 2024-2029 reflects the vision of developing and improving the digital ecosystem of employment in the labor market, which confirms the need for an in-depth analysis of the structural employment transformations in the context of the economy digitalization, considering regional specifics.

The degree of scientific development of the research topic. In this dissertation, the main issues on the problem of employment are reflected in the works of the classics of economics A. Smith, D. Ricardo, J.B. Say, A. Marshall, A. Pigou, K. Marx, D.M. Keynes. Significant contributions to the study of employment in modern conditions have been made by scientists from the CIS countries, such as Z.A. Kapelyuk, S.D. Kapelyuk, V.P. Klavdienko, R. Kapelyushnikov, I.A. Strelets, G.G. Golovenchik, G.S. Sologubova, V. M. Sharapova, I.V. Tsygankova and others. The Kazakh scientific school also contributed to the disclosure of social issues and the regulation of labor relations in the works of such scientists as E.B. Aimagambetov, A.A. Alimbayev, M.B. Kenzheguzin, M.K. Meldakhanova, T.P. Pritvorova, Z.A. Salzhanova, A.T. Abdikarimova and others. In the digital economy, employment issues are highlighted in the works of foreign authors Author, Brynjolfsson, McAfee, Frey, Osborn, Arntz, Acemoglu, Restrepo, etc.

However, despite the existence of a significant body of theoretical and empirical research on the problems of employment and digital transformation, the issues of

regional differences, adaptation of labor resources to digital changes and the formation of effective employment regulation mechanisms at the level of individual territories remain insufficiently studied. This necessitates the development of evidence-based approaches to assessing the impact of digitalization on employment and developing practical recommendations focused on the regional level.

The Government's priorities for developing human capital, increasing productive employment and reducing socio-economic imbalances between regions require a deep understanding of the mechanisms of structural changes in employment and the factors determining their dynamics. Without considering the regional peculiarities of digital transformation, it is impossible to ensure the sustainable development of the labor market and the effective use of the country's labor potential, as well as the improvement of state employment policy in the digital economy.

In the digital economy, traditional forms of employment based on stable employment in one enterprise and a fixed workplace are gradually giving way to flexible work formats. The spread of remote work, project employment, self-employment, and the platform economy is changing not only the nature of labor relations, but also the mechanisms of social protection for employees. These changes require a review of existing approaches to employment regulation, human capital development, and the formation of a vocational training system focused on the rapidly changing demands of the labor market. In the context of digitalization, special attention should be paid to youth employment, since it is young people who are the most mobile and susceptible to technological innovations in the population. On the one hand, the digital economy opens up new employment opportunities, self-realization and entrepreneurial activity for young people. On the other hand, the discrepancy between the education system and the requirements of the digital labor market, the insufficient level of digital and software competencies, as well as regional restrictions can become factors in the growth of youth unemployment. In this regard, the study of youth employment factors at the regional level is of particular importance.

The development of transformational processes in the economy of the Republic of Kazakhstan makes it necessary to redefine the current development of employment in the context of digitalization, to work out the theoretical aspects of employment research, to study trends in the development of employment that arise in the context of the digitalization of the economy. All these topical issues have largely determined the choice of the topic and the purpose of the study.

The purpose of the dissertation is to study the structural transformation of employment in the context of digitalization of the economy and to develop scientifically sound recommendations for improving the efficiency of labor resources use at the regional level.

To achieve this goal, the following tasks have been set and solved:

- the theoretical approaches of employment of the population in modern conditions have been investigated and systematized;
- the models of formation of employment of the population of foreign countries have been investigated;
- the features of new forms of employment in the context of digitalization have been identified;

- the analysis of employment development of the population of the Republic of Kazakhstan and the Karaganda region has been carried out;
- the factors influencing employment in the Karaganda region have been identified;
- a sociological study of the factors of competence development and the degree of their influence on changes in labor relations was conducted through a survey of the population of the Karaganda region;
- a comprehensive analysis of the vacancy market in Kazakhstan and the Karaganda region has been carried out;
- a comparative analysis of digital platforms in the labor market has been carried out in accordance with the recommendations of the OECD;
- an interactive platform has been developed to enhance digital and software competencies as a tool to increase employment in the region;
- recommendations have been given on improving the regional employment policy in the context of the digitalization of the economy of Kazakhstan.

The object of the study is the employed population of the Republic of Kazakhstan and the Karaganda region.

The subject of the dissertation research is determined through the unity of theoretical foundations, empirical provisions on employment and practical recommendations related to the development of labor relations and interaction of labor market actors in the context of the digitalization of the economy.

The scientific novelty of the dissertation research is to identify regional structural changes in employment in the digital economy and to develop a model to assess the impact of social determinants on employment both in the region and the country as a whole.

The theoretical significance of the research lies in the development of scientific ideas about the employment of the population as a dynamic socio-economic category that is being transformed by the influence of digital technologies. The results of the study expand the theoretical provisions on the relationship between digitalization, human capital and structural changes in the labor market.

The practical significance of the thesis lies in the possibility of using the findings and recommendations in the activities of state and regional government, in the development of employment promotion programs, the formation of regional digital development strategies and the improvement of the system of professional training and retraining.

The main methods used by the dissertation are methods of structural, comparative, factorial and correlation-regression analysis, as well as a systematic approach that considers the peculiarities of transformational processes taking place in the economy.

The research results can be used in preparation for training sessions in the following disciplines: “Labor market analysis and unemployment”, “Labor Economics”, “Project Management”, “Models and methods of IT project management”, etc.

The empirical basis of the study was made up of official statistical data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of

the Republic of Kazakhstan, materials posted on the official websites of the Ministry of Labor and Social Protection of the Republic of Kazakhstan, the Department for Coordination of Employment and Social Programs of the Karaganda Region, the Department for Youth Policy of the Karaganda Region, the Organization for Economic Cooperation and Development (OECD), the World Bank, the United Nations (UN), the International Labour Organization (ILO).

The main provisions of the dissertation research submitted for defense:

- the author's approach to the concept of structural transformations of employment in the context of the digitalization of the economy has been formulated based on the study of theoretical approaches and foreign models of employment formation, the content of the digital ecosystem of labor and the signs of structural transformations of employment have been clarified;

- the factors influencing employment and incomes of the population of the Republic of Kazakhstan and the Karaganda region have been identified on the basis of correlation and regression modeling, the depth and direction of structural changes in employment in the territorial and temporal context using the index method have been revealed.;

- the professional standard has been proposed, developed by the author, which sets out the requirements for the new profession of "IT curator" in the field of coordination and support of IT projects;

- the methodological basis of the digital platform «Soft-skills» has been developed, aimed at the formation and development of digital and soft competencies of the population;

- the set of recommendations has been proposed to improve the employment policy of the Republic of Kazakhstan, considering the identified trends, factors and changes in the employment structure, and the scenario for the well-being of the self-employed in the Karaganda region has been developed in the context of the digitalization of the economy.

Approbation and implementation of research results. The main results of the dissertation research of the dissertation author were published in 8 scientific publications, including 1 article in a scientific publication included in the Scopus database, 4 articles in journals recommended by the CQASHE RK, 3 articles in materials of foreign publications and international scientific and practical conferences. As part of the participation in the international department research theme: “Modern determinants of the standard of living of the population and the impact of the labor market”, selected studies were included in the author's collective monograph. The electronic training manual has been developed for the platform on the development of digital and software competencies, as well as the professional standard for the profession of “IT curator” for the educational program 6B06103 “IT Analytics” of the Karaganda University of Kazpotrebsoyuz.

The structure and the scope of the dissertation. The thesis consists of normative references, notations and abbreviations, an introduction, three sections, a conclusion, a list of sources used, and four appendices. The content of the work is presented on 148 pages using 209 sources, 31 tables and 62 figures.

The first chapter of the dissertation work shows the theoretical and practical aspects of employment in the economy, determines the importance of the problem under consideration by representatives of various economic trends and outlines the main research trajectory of the dissertation subsequent sections.

The first chapter shows the evolution of the views of representatives of classical economic schools on employment and the labor market, as well as representatives of domestic and foreign trends in the context of digitalization of the economy. The scientific schools of the XX-th century were marked by the development of economic thought on the impact of innovations and new information technologies on employment. In the digital economy, production is being improved, new information technologies are being introduced, business processes are being automated, artificial intelligence is being used, big data management is based on skilled labor and low-skilled labor is being displaced. Employment in the labor market is determined by qualitative characteristics such as competence, skill power, and labor productivity, which are reflected in the creation and processing of information, and the emergence of “digital” labor.

The transformational changes of employment in the context of digitalization of the economy in the scientific space are considered by Western authors as the technological process-driven development that affects jobs both positively and negatively. Scientists from the post-Soviet space are of the opinion about the impact from the standpoint of macroeconomic consequences and the establishment of equal social and labor relations, expanding limited employment opportunities, but at the same time increasing risks in a single-industry town. Domestic researchers determine that the socio-economic development of the country is impossible without the accumulation and increase of human capital. Therefore, structural changes contribute to the emergence of a new direction in socio-economic development, affecting the social structure and causing radical changes in employment.

Based on this, we propose an author's interpretation, where by structural transformations of employment in the context of the digitalization of the economy we mean changes in the quantitative and qualitative parameters of the workforce, reflecting sectoral shifts in the employment structure caused by the development of digital technologies.

In the section “Foreign experience in the formation of employment”, four main foreign models are proposed as fundamental employment models: Swedish, European, American and Japanese. The Swedish employment policy model is based on several key provisions. First, the priority is to ensure full employment for the working-age population. Secondly, the state guarantees a wide range of social support to citizens. Thirdly, equal conditions are being created to increase the level of material security of the population. The American model is focused on achieving the personal success of the employee and his self-realization, and is more decentralized in matters of employment and social security, labor market legislation. The German employment model is characterized by the active participation of the state in regulating labor relations. Government agencies provide support to entrepreneurs who create additional jobs, as well as provide benefits to enterprises that avoid large-scale staff reductions. The Japanese model is a «philosophy» of lifelong employment that creates mutual

obligations between employer and employee and establishes a convergence of interests between the two parties. It should also be noted that the lifelong commitment of the company's employees contributes to reducing labor mobility between different firms. In Kazakhstan, the American-Japanese model is more projected on the labor market.

The section “Digitalization as a vector of structural transformations of employment” defines the features of digital technologies, the active spread of which leads to changes in employment. A characteristic feature of these changes is the expansion of forms of flexible employment, including self-employment, remote work and part-time employment. The features of digital technologies are that the use of digital resources allows employees to carry out economic activities outside the traditional workplace, which reduces barriers to participation in work. As a result, the forms of employment become more flexible.

The impact of digitalization on the labor market forms a digital ecosystem of work, shown in Figure 1. Training allows you to acquire skills for new professions. Using digital tools and platforms, an employee is looking for a job where algorithms ensure accurate selection. Due to the remote mode of work, an employee can take up this position regardless of his location. In order to remain in demand and improve competencies, an employee must have access to training.

Thus, digital technologies create a more dynamic, fair and flexible ecosystem of work, where the employee has the tools to build a career according to his own scenario, and the digital economy has the mechanisms for the effective use of labor resources.

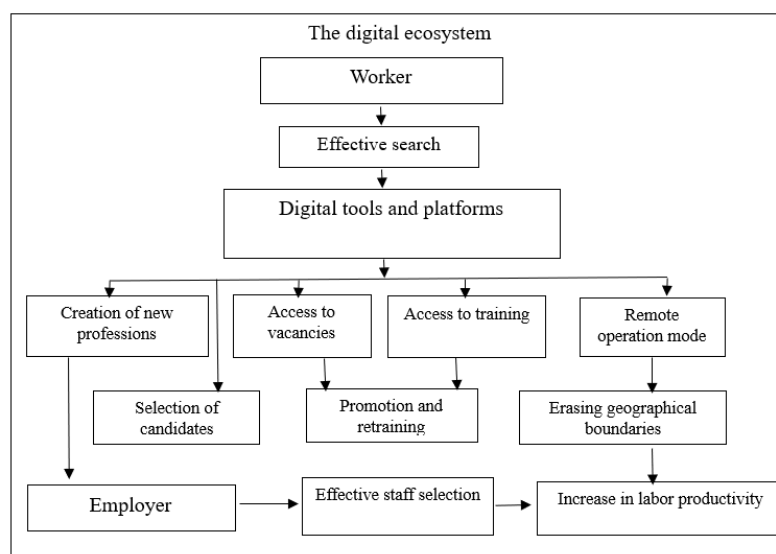


Figure 1 – Digital ecosystem of work

Note – Compiled by the author

Digitalization of the economy and the development of technologies “Industry 4.0” have significantly changed the employment structure, leading to the disappearance of a number of traditional professions and the formation of completely new areas of activity. The analysis conducted on the basis of the “Atlas of New Professions and Competencies of Kazakhstan” shows that changes in the labor market are influenced by trends such as automation, robotics, artificial intelligence, big data, the internet of

things, as well as the development of digital platforms and remote employment. According to the Atlas of new professions and competencies, the main trends in the Karaganda region can be described as the transition from manual processing to digital professions. New professions have the skills to manage digital processes and analyze data. The structure of the Karaganda region is shifting away from the dominance of mining professions and is focusing on engineering, environmental and IT areas.

In this regard, new professions require digital skills, programming, data analysis and design solutions, so it is necessary to develop regional retraining programs for mining sector workers to prevent unemployment. The information, software and mobile applications being developed in combination with artificial intelligence will expand the capabilities of automated robots in production, which in the foreseeable future will ensure the functioning of business processes in the service sector, thereby becoming the engine for the formation of a new model of interaction in the field of employment and professional choice of young people.

The second chapter forms the empirical research of further dissertation work. In the analytical part of the comparative analysis of employment, the influence of socio-economic factors on employment and income of the population in the Republic of Kazakhstan and the Karaganda region was modeled. In our two-stage study, an attempt was made to answer the following research questions:

1. What factors influence the growth of the employed population by employment status.

2. What factors influence the increase in income from work?

Annual statistical data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan on these indicators for the period from 2011 to 2024 were used to build econometric models. In accordance with this goal, the following research hypotheses were put forward:

H1. Formal employment and GRP have a positive effect on the growth of the employed population by employment status.

H2. Income from work is positively affected by the growth of the employed population in terms of employment status and pension.

To test the first hypothesis, the growth of the employed population by employment status was taken as a dependent variable (a resultant indicator). To test the second hypothesis, the growth in income from work was taken as a dependent variable. The correlation and regression analysis made it possible to select factors growths of which have a close statistically significant relationship with the growth in the resulting indicator. The modeling results indicate that in the first model there is a close relationship between the dependent variable and two factor features at the same time, in the second model there is an average relationship with only one factor. The statistical significance and reliability of the first model is 95%, the second is 90%. Thus, the H1 hypothesis was confirmed for the Republic of Kazakhstan: the growth of the employed population by employment status is positively influenced by the growth of formal employment and the growth of gross regional product per capita.

The H1 hypothesis was partially confirmed in the Karaganda region: the growth of the employed population by employment status is positively influenced by the growth of formal employment. The results of stage 2 modeling indicate that in the first

model there is a close relationship between the dependent variable and two factor features at the same time, in the second model there is an average relationship with only one factor. The statistical significance and reliability of the models is 95%.

The H2 hypothesis was confirmed according to the data of the Republic of Kazakhstan: the growth of income from work is positively influenced by the growth of the employed population in terms of employment status and the growth of pensions. According to the data of the Karaganda region, the H2 was partially confirmed: the growth of income from work is positively influenced by the growth of pensions. The impact of structural transformations on the incomes of the population is expressed not only in the direct impact on real wages, but also directly through the impact on employment.

To assess the structural changes of employment, we denote the algorithm of analytical research. The main blocks of the analytical model algorithm are: assigning variables the value of an array of data for the Republic of Kazakhstan and the Karaganda region, building a structural model of relationships, inter-territorial correlation analysis of the Republic of Kazakhstan and the Karaganda region, calculating the index of the A. Salai method of structural changes, interpreting the results and forming conclusions. The use of an analytical model will enhance the objectivity of interpretation and ensure the holistic and systematic nature of analytical conclusions.

Data on the distribution of employees by type of economic activity for the study period are used as objects of analysis. The calculation results form a quantitative basis for subsequent interregional and intersectoral comparisons.

The value of the Salai index for the sectoral structure of the employed population in the Karaganda region is 0,1913, which is significantly higher than the national figure of 0,1523. This indicates a deep structural restructuring of the region – the manufacturing industry and the service sector are replacing traditional agricultural employment much faster than the national average. The Salai index at 0,2383 for the Republic of Kazakhstan indicates a process of “soft intellectualization”.

The main contribution to the index was the explosive growth of the category of "Professional Specialists" (from 13,9% to 24,2%). This is a direct consequence of the digitalization of the economy and the expansion of the service sector. At the same time, there is a natural “leaching” of low-skilled personnel and a reduction in the share of workers in the agricultural sector, which brings Kazakhstan's employment structure closer to the models of developed countries. In the Karaganda region, the Salai index (0,1616) is lower than in the Republic of Kazakhstan, which indicates a more intensive structural change. Since the Karaganda region was previously positioned as an industrial region, there is now a pronounced reduction in the proportion of workers and operators of production facilities, while increasing the administrative and managerial staff. The high value of the index in the region is explained by the need for rapid adaptation of old industrial professions to new technological realities and automation of production.

The section “Analysis of structural changes in the forms of employment of the population” notes the radical changes that have occurred in the structure and form of employment in post-industrial society. With the emergence of flexible non-standard

forms of interaction between labor market entities, Kazakhstan needs to determine its trajectory from the most significant new forms of employment that exist to varying degrees in most of the fund's member states, which helps reduce employers' costs and increase labor market flexibility. Special attention should be paid to legal and economic mechanisms for regulating labor relations of new forms of employment. The analysis shows that Kazakhstan actively uses information and communication tools and methods of promotion in the labor market through online platforms, both domestic and foreign. In the field of employment, it is also necessary to develop digital and soft competencies using new generation digital technologies.

In the third chapter, a sociological study “The role of competencies in the development and enhancement of the labor potential of the labor market” was conducted to identify the factors of competence development and the degree of influence on changes in labor relations. When conducting a survey among the population in the Karaganda region, it was revealed that the maximum number of respondents noted flexible (48,1%) and digital (38,1%) skills. It is noteworthy that the analysis of resumes on the main domestic employment platforms and the results of a survey on the requirements for applicants in both Kazakhstan and the Karaganda region are the main software and digital competencies: teamwork, communication skills, PC knowledge, project management. Changes in the labor market are associated with the emergence of new professions, with the formation of a new employment paradigm, which leads to regional competition, ensuring a satisfactory quality of life and well-being of the population.

Thus, digitalization of the labor market, the formation of new educational requirements and the growing demand for flexible and digital competencies become a necessary condition for the formation of competencies. To solve this problem, the dissertation researcher has developed a professional standard that sets out the requirements for the new profession of “IT curator” in the field of coordination and support of IT projects.

In order to form and develop digital and soft competencies of the population, the doctoral student developed the methodological basis of the digital platform “Soft-skills”. This digital platform allows employers to identify a set of digital and soft competencies for interested parties, as well as identify the current and future need for competencies in the labor market.

The changes brought by the digitalization of the economy create a new format of interaction between all participants in the labor market. On the part of applicants, this is the development of new competencies and skills. On the part of government agencies, this is the provision of services on the sites for the improvement and acquisition of new skills. On the part of higher education institutions, these are the creation and development of courses for the acquisition of software and digital competencies.

The well-being scenario has been developed separately, focused on the development of self-employment in the Karaganda region, which contributes to strengthening and expanding employment opportunities in the region.

As a mechanism for improving the policy of self-employment of the population in the context of digitalization, it is necessary to consider the following areas:

1. To bring into one legal field the concepts of non-standard and new forms of employment in the Labor Code of the Republic of Kazakhstan and the Social Code of the Republic of Kazakhstan: crowdworking, rental work, outsourcing, remote work as a necessity for the development of flexible employment. Introduce into the legal framework forms of self-employment through digital platforms (offline and online work), gaming (e-sports), and work in the creative industries as new directions in the development of labor relations between labor market participants. Legislative consolidation of the conceptual framework of non-standard forms of employment will become a condition for removing a significant segment of labor relations from the “gray” zone, create legal guarantees for employees and form a transparent basis for taxation.

2. The formation of a new self-employment policy and the activation of an unproductive group of the population through self-employment within the framework of a well-being scenario for regional policy. Legalizing and regulating new forms of employment will help protect workers' rights. We also see increased regulation of the labor market through the expansion of alternatives and the creation of digital platforms for employment opportunities, thereby reducing income gaps, and through the development of social protection mechanisms for new forms of employment.

3. Support for small businesses.

It is necessary to stimulate entrepreneurial activity through tax support and financial subsidies, as well as improve the ecosystem of entrepreneurship by offering financial support to startups. The government should encourage enterprises to implement regional and sectoral innovation projects such as smart manufacturing, smart agriculture and smart logistics, facilitating the influx of technological and innovative resources. Due attention should be paid to building digital ecosystems at the enterprise level. Enterprises, in turn, should develop and promote business models that stimulate employment growth.

The implementation of the proposed package of measures will make it possible to form a labor market in the Karaganda region that meets the challenges of the digital economy. The key result will be the creation of an institutional environment where new forms of employment are fully integrated into social insurance mechanisms. Digital platforms and analytical information systems will serve as tools for necessary social support, providing targeted assistance to vulnerable categories of citizens and allowing them to quickly adjust policies in changing conditions. This will eventually lead to a reduction in poverty and an increase in economic activity of the population.

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