

The Role of Digital Technologies in Balancing the Labor Market in the Conditions of the Post-War Recovery of the Ukraine's Economy

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Abstract: The article examines the conditions that shape the demand and supply of labor, namely: digitalization of all spheres of life, functioning of the real sector of the economy, natural growth (reduction) of the population; dynamics of migration processes in the country. The destruction of numerous industrial enterprises as a result of military actions on the territory of Ukraine caused a decrease in the overall level of employment and an increase in unemployment. It is argued that the post-war recovery of Ukraine's economy may face labor shortages and economic stagnation. The article emphasizes that the population engaged in economic activity on the territory of Ukraine forms aggregate demand, increasing revenues to the budget, making it possible to implement and raise social standards. External population migration, on the contrary, increases the aggregate demand of other countries. It is noted that the probability of an imbalance in the labor market during the post-war reconstruction of Ukraine can be caused by: the dismissal of certain categories of workers as a result of automation and digitalization; raw material orientation of economic activity; insufficient number of enterprises for processing own grown and mined raw materials; the lack of methodological tools' development for improving investment attractiveness as a prerequisite for increasing the level of employment and reducing external migration; a weak level of information support for the importance of forming aggregate demand for consumer goods of own production, etc. Ways to balance the labor market in the period of post-war economic recovery of Ukraine, measures to reduce external migration and population depopulation are proposed.

Keywords: digital technologies, external migration, labor market, industrial enterprises, labor potential, natural population growth (decrease), investment attractiveness, population savings, managerial competences, post-war economic recovery, national economy.

1. INTRODUCTION

The labor market is a factor market and at the same time depends on transformational processes in the economy. Thus, the unsoldering of land in Ukraine, the lifting of the

moratorium on the sale of land, the concentration of land by agricultural holdings reduce the number of jobs in rural areas and do not create prerequisites for the activation of innovative and investment activities in the countryside. If we add to this the destruction of the industrial structure as a result of military actions on the territory of Ukraine, the automation of technological and business processes, then a situation emerges of a decrease in the number of jobs both in rural areas and in recently industrially developed cities that suffered as a result of active military actions. In addition, the processes of globalization, digitalization, and technological

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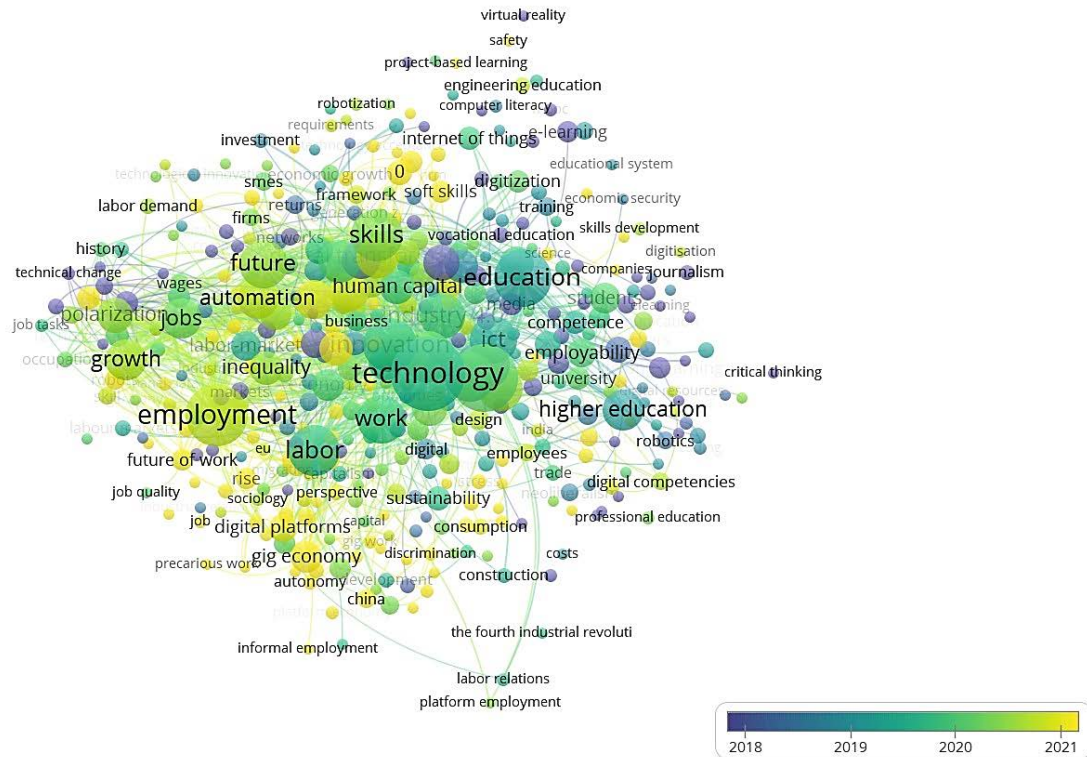


Fig. (1). Visualization of the publishing activity of scientists whose research titles contain the words "labor market, digital technologies, digitalization" according to the Web of Science database

Source: compiled by the authors based on the analysis of the Web of Science database and using the tools of the VOSviewer program.

capabilities lead to an increase in non-permanent, remote employment, a decrease in the share of physical labor, and an increase in the role of services.

The war in Ukraine and the migration, demographic, and economic processes caused by it create an imbalance in the labor market and change the forms of employment. The ratio of labor supply and demand in the labor market is a factor influencing the course of most economic processes in the country, which necessitates the study of its structure, influencing factors, and finding ways to eliminate the imbalance.

2. LITERATURE REVIEW

Many economists study the labor market as an important determinant of economic processes. Fig. (1) shows the analysis of publications in the scientific metric database Web of Science, in the titles of which the words "labor market, digital technologies, digitalization" are found.

Within the framework of article (Azmuk N., 2015), the changes that the labor and higher education markets undergo under the influence of information and computer technologies are given. The authors of the article examine trends in the development of the labor and higher education markets under the influence of ICT and substantiate that digital technologies are a factor in the convergence of these markets. Scientists are convinced that digital technologies are a tool for reducing the disparity between the labor and education markets: creating innovative professionals, solving the problem of youth unemployment, and integrating universities and businesses.

The authors of (Sabrin B., 2022) examine the effects of a land and labor market tenure reform that computerized rural land records in Pakistan, making digitized records and automated transactions available to agricultural landowners and farmers.

Scientists (Burkert Carola et al., 2022) claim that the digital transformation affects the labor market and the existing gender inequality. The results of the authors' multivariate analysis show that there is a negative relationship between occupation-specific substitution opportunities and employment growth for women and men. The article concludes that digital transformation has the potential to reduce gender inequality in the labor market.

A scientific study (Szabó-Szentgróti G. et al., 2021) notes that the scale of technological unemployment is determined by the digitalization strategy of each country and the speed of its implementation, as well as the readiness of the education system in a particular country to retrain vulnerable segments of the population in the labor market. The authors believe that, on the one hand, digital transformation opens up a wide range of opportunities for a more human life, and on the other hand, from an economic point of view, digitalization will become an inevitable element of competition from the side of reducing marginal costs.

It has been proven (Zoltán Rajnai et al., 2017) that Industry 4.0, the digital transformation of production, is changing the labor market. The authors investigated that the consequences of the rapid technological development of the fourth indus-

trial revolution pose enormous challenges for society and politicians.

The authors (Deborah Giustini, 2023) explored that as Japan's platform economy is growing rapidly, we have limited understanding of how digital platforms work at the intersection of the dual labor market and how this affects the worker experience. Guided by political economy and critical sociological approaches to dualism, scholars examine how platform work intersects with Japan's growing employment gap.

According to the authors (Goloventchik G.G., 2023), the digital economy, which increasingly affects the global labor market, opens up new opportunities for solving employment problems, among these opportunities it is worth noting digital labor platforms. It has been studied that platform employment has already significantly changed and continues to change the structure of the labor market in the developing digital economy, radically transforming the relationship between employers and employees.

The results of the study (Kurmanov Nurlan A. et al., 2023) prove that changes in the labor market are an inevitable result of technical progress. The authors claim that the effectiveness of government policy will depend on the correct forecasting of the future balance in the labor market and on factors that can affect technological development, elimination or preservation of jobs. On the basis of correlation-regression analysis, the authors of the article investigated the influence of various factors on the transformation of regional labor markets in the context of digitalization.

According to the authors (Didier N., 2022), industrialized countries are experiencing the transition of the economy from knowledge to digital. Scholars argue that this transition is strictly determined by how the labor market is organized and functions in the national economy.

Despite the thorough methodological and practical aspects of labor market research, the specified category changes so dynamically in quantity and quality that it requires constant analysis, clarification of influencing factors and search for methods of solving problem situations.

3. METHODOLOGY

When writing the article, both general and specific scientific methods were used to collect information, process it and analyze the final results of the research. General scientific methods in the part of empirical research (observation, comparison) made it possible to determine the demand and supply of labor in Ukraine by comparing the information posted on the job search sites Robotu.ua and Work.ua.

When determining the impact of digitalization and external migration on balancing the labor market in the post-war period, such general scientific methods as idealization, formalization, and logical methods were used. The use of the mentioned methods made it possible to abstract from a possible optimistic or pessimistic scenario of the development of the economy of Ukraine and to propose ways of balancing the labor market.

In the further analysis of the labor market, specific scientific methods were used, in particular, the method of statistical

analysis, the graphic method, in order to visualize the existing imbalance between the supply and demand for labor force in terms of categories and cities by specialty.

In the conditions of limited financial aid from the state, it is advisable to consider own funds of enterprises and credit resources as the main source of maintaining existing and creating new jobs. In this context, the tax regulation of entrepreneurial initiative and the stimulation of population savings, the development of a motivational mechanism for the use of population savings for investing in the national economy and the creation of aggregate demand in Ukraine become fundamental.

The amount of population savings for long-term lending or investment of the national economy can be calculated as follows:

$$I_{vp} = \sum S_{vi} - \sum S_{vst}, \quad (1)$$

where $\sum S_{vi}$ – the total amount of funds temporarily not used for current needs and accumulated in the form of savings of the population (currency in the hands of the population, sums of deposits in banks and other credit institutions, investments of the population in securities);

$\sum S_{vst}$ – savings that cannot be used for long-term lending or investment. Among them, it is necessary to take into account funds: exported abroad and used there for consumption or investment; funds accumulated through social insurance funds; used in the mortgage lending system, etc.

4. RESULTS

Digitalization, automation of business processes, structural restructuring of Ukraine's economy, reduction of social sector financing, destruction of numerous industrial enterprises as a result of military actions on the territory of Ukraine caused a decrease in the overall level of employment, and, accordingly, an increase in full, partial, hidden unemployment. The closure of a large number of enterprises in the South, East, and North of Ukraine led to an aggravation of the problem of structural unemployment.

Regarding the natural increase (decrease) of the population as a condition for the formation of a balanced labor market, Ukraine belongs to the top ten countries with the highest level of population decrease along with such countries as Bulgaria, Lithuania, Moldova, Ukraine, Croatia, Romania, Serbia, Poland and Hungary. If Bulgaria, Romania, Poland and Hungary attracted a large number of migrants, then in Ukraine, in addition to high mortality and low birth rates, colossal rates of external migration are added (galinfo.com.ua, 2023).

Even in the pre-war period, the population of Ukraine and the level of employment gradually decreased, and the level of unemployment increased. As a result of the war on the territory of Ukraine, these trends continued, but at a faster pace. According to NBU estimates, in 2022 the unemployment rate already reached 25–26% (3.2 million unemployed people), and in 2023 it is expected to be almost 26.1%. In the pre-war period, the unemployment rate was almost three times lower (8.6% in 2019, 7.2% in 2013) (National Bank of Ukraine, 2023).

Table 1. Information about vacancies and submitted resumes on the job search sites Robota.ua and Work.ua as of the beginning of August 2023.

Region	Site name					
	Robota.ua		Work.ua			
	Demand (Vacancies)	%	Demand (Vacancies)	%	Proposal (Summary of Candidates)	Excess Supply Over Demand
Kyiv	26473	33,2	25384	27,1	100155	3,9
Lviv	5483	6,9	7303	7,8	30622	4,19
Dnipro	4318	5,4	6871	7,3	24128	3,5
Odesa	4488	5,6	6004	6,4	24834	4,11
Kharkiv	3314	4,2	3345	3,6	19555	5,8
Vinnitsa	1679	2,1	2466	2,6	12413	5,03
Ivano-Frankivsk	1439	1,8	2160	2,3	8850	4,1
Khmelnyskyi	1348	1,7	1810	1,9	6616	3,66
Ternopil	1180	1,5	1786	1,9	6800	3,81
Zaporizhzhia	1240	1,6	1763	1,9	9579	5,43
Cherkasy	1123	1,4	1703	1,8	6569	3,86
Rivne	982	1,2	1598	1,7	7101	4,44
Poltava	1351	1,7	1588	1,7	7451	4,69
Chernivtsi	1178	1,5	1566	1,7	4898	3,13
Lutsk	872	1,1	1485	1,6	7087	4,77
Zhytomyr	1065	1,3	1173	1,3	6013	5,13
Mykolaiv	884	1,1	933	1,0	5341	5,72
Chernihiv	652	0,8	748	0,8	4281	5,72
Sumy	691	0,9	672	0,7	4490	6,68
Kherson	134	0,2	194	0,2	1515	7,81
Ukraine	79546	100	93577	100	383619	4,1

Source: compiled according to the data ([Robota.ua](https://www.robota.ua), [Work.ua](https://www.work.ua)).

Active hostilities destroyed a large number of enterprises. Enterprises of almost all branches of the economy of Ukraine that survived reduced the volume of production, especially in regions where hostilities took place, as well as in de-occupied regions. At the same time, unemployment and informal remote employment increased. At the beginning of 2023, there were approximately 2.6 million unemployed people in Ukraine. Currently, eight unemployed people are applying for one job in the employment centers (four unemployed people applied for one job in the pre-war period) (Potapenko V. *et al.*, 2023).

At the beginning of 2022, the unemployment rate increased due to planned layoffs of public sector employees (about 16,100 employees, in particular in: Poltava region - by 1.5 thousand, Kharkiv region - by 1.4 thousand, Kirovohrad region - by 1.2 thousand, Zhytomyr – 1.1 thousand, Khmelnytsky – 1.1 thousand employees (State Employment Service, 2022).

If we analyze the job search sites Robota.ua and Work.ua, it can be noted that as of the beginning of August 2023, employers posted information about 79,546 vacancies on the Robota.ua website and 93,577 on the Work.ua website. The lion's share of vacancies falls on Kyiv (33.2%), Lviv (6.9%), Odesa (5.6%), Dnipro (5.4%) (Table 1).

The fewest vacancies were declared in such cities as Kherson (0.2% of the total number of vacancies posted on the job search site Work.ua, Robota.ua), Sumy, Chernihiv, Mykolaiv regions. The number of submitted resumes significantly exceeds the number of posted information about vacancies. Thus, in Kherson region the number of submitted CVs exceeds the number of vacancies by 7.8 times, in Sumy – by 6.7 times, Kharkiv – by 5.8 times, in Chernihiv and Mykolaiv regions – by 5.7 times (Fig. 2, 3).

According to expert estimates, as of the end of 2019, up to 5 million Ukrainians were already working abroad (mainly in

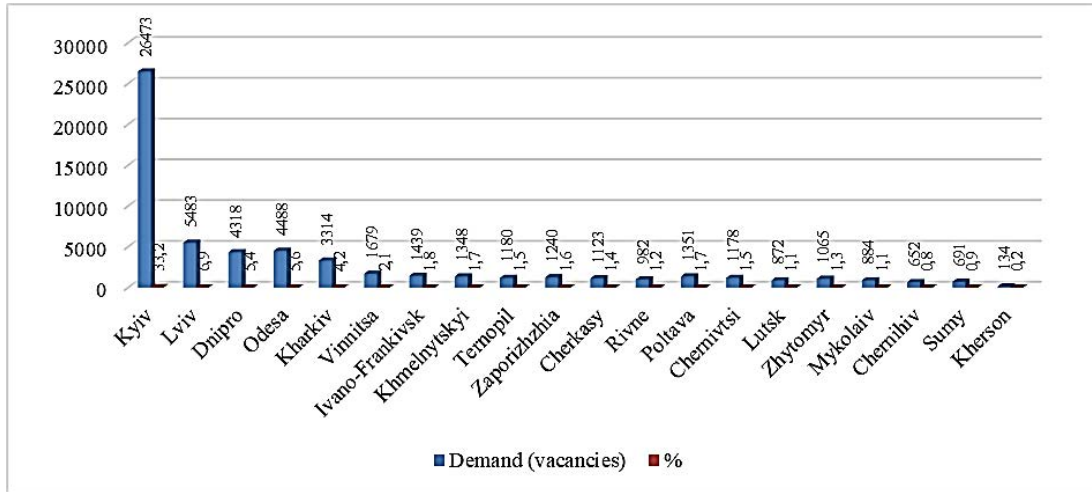


Fig. (2). Indicators of labor demand by the region based on information from the Work.ua website as of the beginning of August 2023.

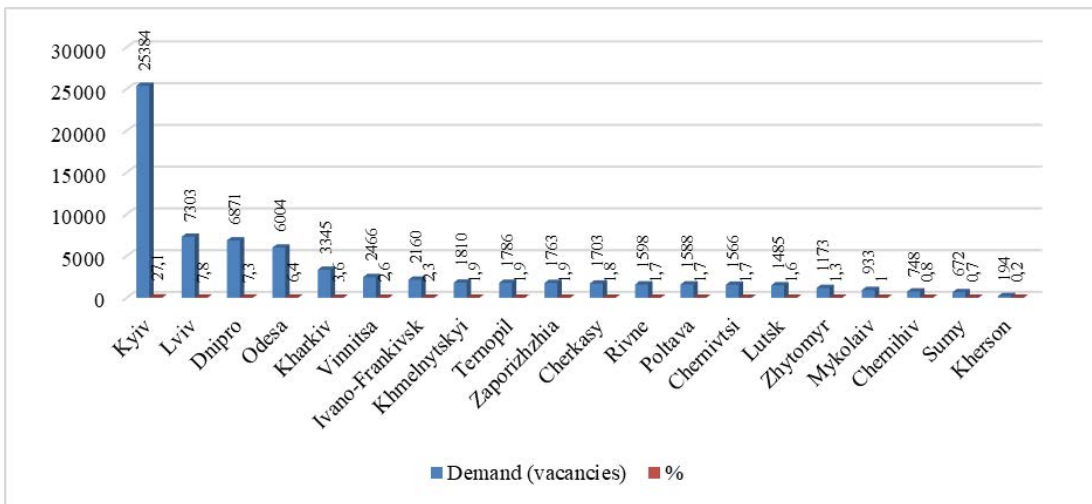


Fig. (3). Indicators of labor supply by the region based on information from the Work.ua website as of the beginning of August 2023

Poland, the Czech Republic, and Hungary). Ukraine invests in the education of the youth, a large part of which moves abroad for employment, which caused a shortage of personnel and began to threaten national security even before the full-scale invasion (New voice, 2018).

The war on the territory of Ukraine intensified the process of departure of Ukrainians abroad. At the same time, mostly women of working age and children leave the country in search of a safer place to live. According to the UNHCR, as of the end of November 2022, about 8 million people were forced to leave Ukraine (the vast majority of whom migrated to EU countries). Only at the beginning of the war, during February and March 2022, external migration amounted to 3.6 million people, and internal (the number of internally displaced persons) - almost 6.5 million people (Cedos, 2022; Potapenko V. et al., 2023). Already in November, more than 1.5 million people migrated to Poland, more than 1 million people - to Germany, 450 thousand - to the Czech Republic, more than 100 thousand people - to Italy, Spain, Bulgaria, Great Britain and France (Tucha O. et al., 2022).

The analysis of the labor market according to the information of the Work.ua website makes it possible to state that there are discrepancies between the demand and supply of labor force by category. Thus, as of the beginning of August 2023, in Ukraine there were the most people willing to work as administrators and middle managers (54,730 submitted resumes) (Table 2). There were only 8,389 vacancies in this category. The excess of labor supply over demand is 6.5 times. The next most popular category among potential employees is the service sector (51,906 resumes are 3 times more than the number of advertised vacancies). One of the largest excesses of submitted resumes over existing vacancies in mass media, publishing and printing is 16.6 times, which may indicate a decrease in the volume of publishing and printing in connection with the development of digital technologies, a decrease in demand for traditional printing products.

In such categories as secretariat, office management, as well as design, creativity, there is also a large discrepancy between demand and supply (9.8 and 8.3 times,

respectively), which is partly caused by a slowdown in the pace of business activity, a decrease in demand for creative, design work in war conditions.

Table 2. Indicators of labor supply and demand by categories and cities based on information from the Work.ua website as of the beginning of August 2023.

Category	Ukraine		Kyiv		Lviv		Dnipro		Odesa		Chernihiv	
	Demand (vacancies)	Offer (candidates)	Demand	Offer	Demand	Offer	Demand	Offer	Demand	Offer	Demand	Offer
Service sector	16972	51906	4773	14155	1724	4483	1106	3026	1228	3844	107	635
Work specialties, production	17306	42427	3834	10810	1375	3179	1580	3814	892	2569	189	551
Administration, middle management	8389	54730	2535	17455	647	5020	638	4262	558	4415	53	620
Retail	11247	46956	2781	6808	829	2738	654	2481	836	2824	92	805
Sale, purchase	12631	45567	3563	9034	889	3023	932	2331	853	2444	128	479
Secretariat, office management	4506	44414	1384	10272	335	3515	372	2463	340	2897	30	519
IT, computers, Internet	5614	43461	1647	12594	345	4115	299	2737	248	2708	20	288
Hotel and restaurant business, tourism	9228	30206	2319	7482	1061	2696	559	1686	635	2305	61	377
Logistics, warehouse, FEA	9213	30625	2181	8173	794	2195	812	2324	654	1981	73	385
Marketing, advertising, PR	5121	27979	1756	7713	351	2241	299	1478	296	1745	22	185
Education, science	4595	27723	1315	7388	335	2630	336	1453	333	1705	24	207
Media, publishing, printing	1624	27029	471	7703	94	2069	116	1262	90	1531	8	158
Transport, auto business	7108	26072	1626	7067	591	1763	568	2078	493	1837	83	266
Accounting, auditing	6105	23281	1876	5923	455	1414	496	1397	442	1546	45	306
Medicine, pharmaceuticals	5885	23000	2001	6428	427	2189	446	1222	377	1420	33	281
Construction, architecture	5313	21714	1376	6990	485	1916	402	1843	249	1511	57	277
Finance, bank	3814	13017	1239	3299	275	824	229	755	231	841	35	177
Telecommunications and communication	3584	16670	998	3867	256	1086	241	978	194	856	34	203
Beauty, fitness, sports	2812	9329	1176	3387	273	1033	159	565	249	840	12	59
Personnel management, HR	1667	10164	572	2875	119	978	121	672	125	688	13	107
Design, creativity	2580	21530	720	7003	265	2192	167	1318	168	1533	21	113
Protection, security	1855	10763	482	3217	88	710	157	909	123	804	23	131
Top management, senior management	1077	10240	389	4827	84	1224	80	1146	61	1082	7	117
Agriculture, agribusiness	1265	3168	236	901	71	248	76	258	64	174	11	59
Jurisprudence	1135	7729	497	2703	62	707	104	481	67	539	11	116

Real estate	657	1019	220	298	78	150	38	51	66	61	8	9
Culture, music, show business	591	8185	214	3589	45	714	37	430	37	700	3	48
Insurance	181	450	91	141	5	30	4	23	6	30	1	3

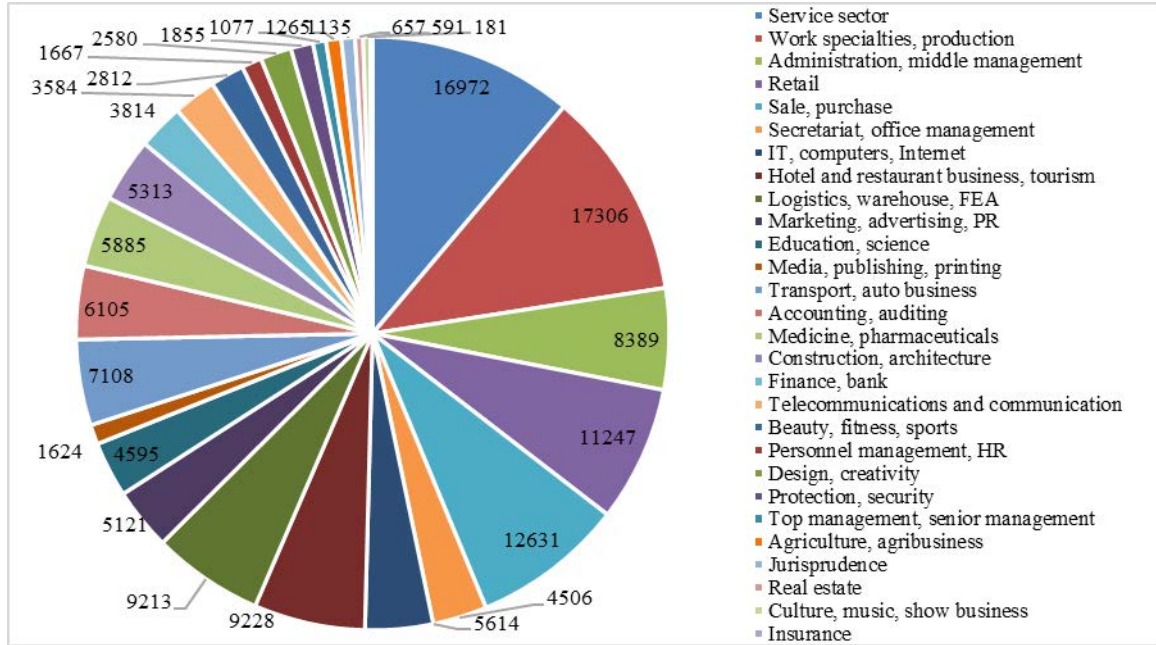


Fig. (4). The structure of labor demand by category based on information from the Work.ua website as of the beginning of August 2023.

Source: compiled according to the data (Work.ua).

The fewest applications and existing vacancies are in such categories as insurance, real estate, agriculture and agribusiness (Fig. 4). If Ukraine will position itself as an exclusively agrarian state with an orientation towards the export of grown agricultural products, then difficulties with the availability of jobs, external migration, population depopulation, especially in rural areas, will increase.

The demand structure is traditionally dominated by such categories as the service sector (11% of the total number of vacancies), work specialties (11% of the total number of vacancies), sales, purchasing (8%), retail trade (7%), administration, middle management (6%), hotel and restaurant business, tourism (6%), logistics, warehouse, foreign trade (6%), construction, architecture (3%).

Digitization, as a rule, contributes to the spread of non-standard, informal (digital) employment, in particular "work on demand", "work on Internet platforms", forms a demand for innovative forms of employment, which are characterized by the following characteristics: a high level of professionalism, digital literacy, permanent self improvement (Markadent F., 2017). Under the influence of digitalization, the requirements for the education system are changing, and new professions are emerging. Under the influence of automation and robotization, the number of employees, especially full-time employees, is decreasing. In the short term, this process will only intensify.

In the period of the post-war recovery of the economy of Ukraine, in order to save costs for staff maintenance, out-

sourcing may become more active, attracting specialists from other countries with lower salaries (IT outsourcing, remote call centers, etc.), which will also reduce the number of traditional jobs that were filled on the national labor market (Pyshchulina O., 2020) (Fig. 5).

In the period of post-war reconstruction of Ukraine with the intensification of business activity, it can be predicted that the demand for skilled labor will grow. Work specialties, specialists in construction and architecture, transport will be especially involved.

Among the categories for which the most CVs are submitted, it is advisable to single out the field of service (8%), administration, middle management (8%), retail trade (7%), secretarial, office management (7%), sales, procurement (7%), IT, computers and the Internet (6%).

The population engaged in economic activity on the territory of Ukraine forms aggregate demand, increasing revenues to the budget, provides an opportunity to implement and raise social standards. Population migration, on the contrary, increases the aggregate demand of other countries. In 2022, the expenses of Ukrainian migrants abroad compared to the previous year increased by 300% and amounted to about 2 billion USD per month. In this way, the funds saved and received in Ukraine are spent, so it can be argued that the probability and scale of transforming the population's savings into an investment resource and increasing the GDP on this basis with the activation of migration processes is decreasing. At the same time, in countries that pursue a

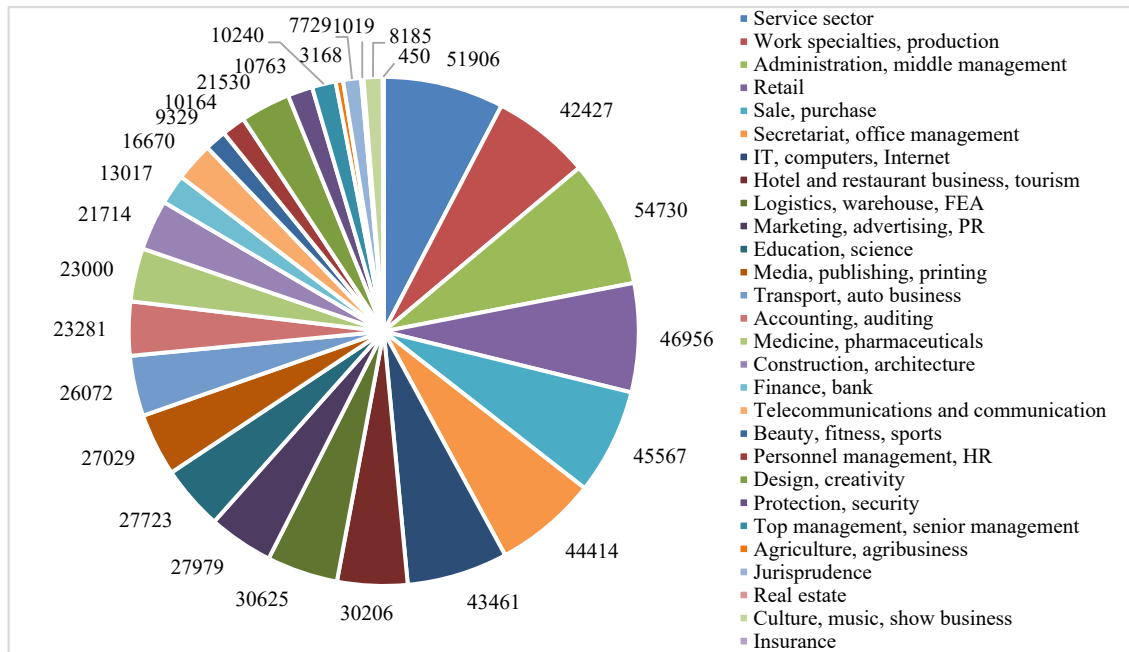


Fig. (5). The structure of labor supply by category based on information from the Work.ua website as of the beginning of August 2023. Source: compiled according to the data (Work.ua).

policy of attracting Ukrainian migrants, the costs of maintenance, education, and adaptation of migrants are significantly lower than the benefits of using labor resources from Ukraine in the long term. According to the forecasts of experts, Ukrainian migrants create the conditions for an increase in the GDP of the countries that have attracted them, from 0.2% in the first year to 1.3% by 2040, provided that the people who arrived are fully integrated (Kancs 'A. et al., 2016).

Ukraine's post-war economic recovery may face labor shortages and economic stagnation. The low level of wages in Ukraine, the destruction of housing, social, industrial infrastructure becomes an obstacle to the return of migrants. The war exacerbated the imbalance in the labor market, the increase in the number of unemployed and migration flows actualizes the problem of the level of wages in Ukraine. Destroyed production facilities and produce the release of workers from economic relations. On the other hand, millions of pre-war labor migrants and millions of forced war migrants make it difficult for potential employers to find workers for the required vacancies.

A characteristic feature of the labor market of Ukraine is the presence of a large sector of informal employment, especially in the sphere of trade and services, shadow economy. In addition, those who work in the shadow economy are not covered by labor laws, social insurance, state guarantees of employment and wages. This is one of the most urgent problems of the formation of both the labor market and the market economy of Ukraine in general, since informal employ-

ment is created and functions in proportion to the size of the shadow economy.

The problem of hidden unemployment remains relevant, which involves the underutilization of the labor of officially employed workers who are employed full-time, but who work either part-time, or with partial efficiency, or with partial payment of labor due to technological, structural, economic reasons beyond their control or of a social nature. At the same time, new vacancies are filled on a full-time basis. As of the beginning of August 2023, employers offer full-time vacancies on the Robota.ua website in 92.2% of cases (on Work.ua, the same situation is 96.9%).

The vast majority of vacancies on the market (84.8%) at the beginning of August 2023 are vacancies with work in the office. Only 8.9% of the total number of vacancies is remote work. For 6.3% of the offered vacancies, potential employees can work both remotely and on-site.

The main problems in the labor market that the government of Ukraine will face in the process of post-war reconstruction of Ukraine are: raw material-oriented economic activity, insufficient number of enterprises processing own grown and mined raw materials a priori causes a decrease in the level of employment; undeveloped methodological toolkit for improving investment attractiveness as a prerequisite for increasing the level of employment and reducing external migration; weak level of information support for the importance of forming aggregate demand for self-produced consumer goods, etc. (Table 3).

Table 3. The use of state tools in solving the problems of balancing the labor market in the post-war period.

The Main Problems	The Main Areas of Problem Solving	Levers of Influence
The raw material orientation of economic activity, the absence of enterprises for the processing of own grown and extracted raw materials a priori causes a decrease in the level of employment	An increase in customs rates for the export of raw materials and a decrease in customs rates for the export of products created in Ukraine. Customs Improvement of the legislation in terms of promoting the creation of enterprises for the processing of raw materials, production of products for own consumption and import substitution	Economical, Legal
An underdeveloped methodological toolkit for improving investment attractiveness as a prerequisite for increasing the level of employment and reducing external migration	Development and implementation at the state level of programs to increase the investment attractiveness of the entire economy of Ukraine, especially war-damaged infrastructure and industrial facilities	Methodical
Lack of informational support for the importance of forming aggregate demand for consumer goods of domestic production	Development of information space, reliable protection of information	Organizational, Informational, Psychological, Campaigning
Imperfections of the existing system of unemployment benefits	Providing the opportunity to receive employment guarantees tied to the place of residence	Economical
Presence of administrative barriers for investors, low quality of state administration and control	Clear separation of powers between the levels of state power and local self-government; improving the quality of state administration; improvement of control	Administrative
The infrastructural limitations of increasing the level of employment are increasing	State order for innovative products; creation of comfortable conditions for conducting business activities; participation in targeted programs for the development of transport infrastructure, health care systems; public-private partnership.	Organizational
Inconsistency of educational and qualification characteristics of the unemployed with modern business demands	Monitoring the labor market, updating educational programs for the retraining of the unemployed	Personnel

Source: developed by the authors.

Market levers are not enough to solve all problems related to unemployment. Therefore, relations arising in the labor market require regulation and provision of social guarantees for citizens at the state level. In this regard, the functions of the state to regulate employment, eliminate the negative consequences of unemployment with the use of administrative, economic, legal, methodical, organizational-informational, psychological-agitational levers of influence are updated.

In order to form and maintain the balance of supply and demand in the labor market, the following are necessary: effective functioning of the real sector of the economy, suspension of the rate of population reduction, reduction of external migration (Fig. 6). The influence of the state on the formation of the labor market in the war and post-war periods should be concentrated, respectively, in the following directions:

1) elimination of disparities in the demand and supply of labor in terms of increasing the demand for labor by increasing jobs, increasing the level of investment attractiveness of the country;

2) overcoming already existing negative processes in the socio-economic sphere, namely unemployment, external migration, the existence of informal employment, etc.

Reducing the level of unemployment, informal employment, reducing the dynamics of migration processes is possible through the implementation of effective mechanisms for the

activation of the production sphere, an increase in the volume of investment in the production sphere, and the protection of the Ukrainian producer. Priority measures in this context are:

- improving institutional support by: strengthening detinization of all spheres of entrepreneurial activity at the legal level, reducing administrative barriers, simplifying state registration, procedures for obtaining licenses, certificates, etc.;

- reduction of tax and credit rates with the aim of revitalizing the innovative activities of business entities, revitalizing and diversifying investment dynamics based on improving the investment attractiveness of Ukraine's economy, increasing the level of management competencies of managers. The policy of "cheap money" should be based on the regulation of the money supply by lowering the interest rate;

- development and implementation at the state level of programs to increase the investment attractiveness of the entire economy of Ukraine, and especially - infrastructure and industry affected by the war;

- monitoring the labor market, updating educational programs for retraining the unemployed, expanding the list of employment services, training specialists in accordance with the needs of the region;

- synchronization of the demands of the labor market and educational programs, increasing the scientific potential of

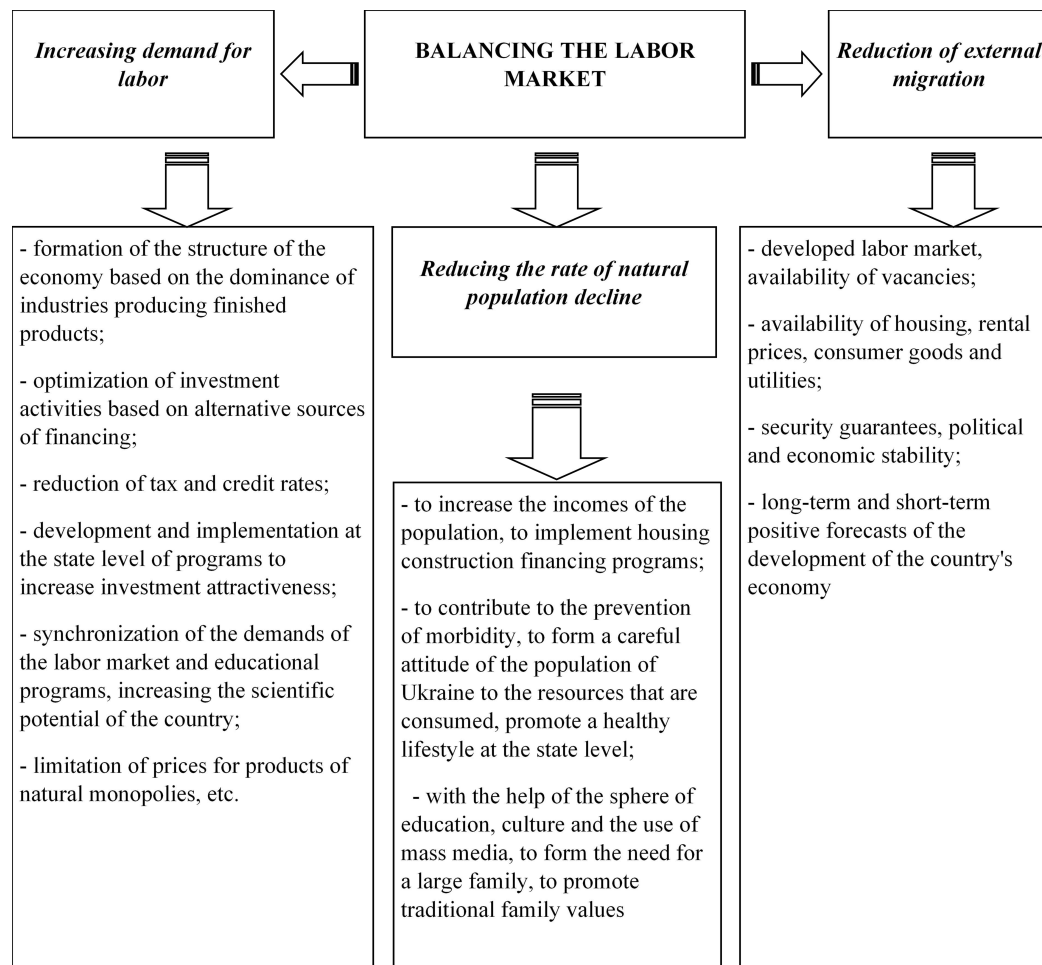


Fig. (6). Formation and maintenance of equilibrium in the labor market of Ukraine.
Source: developed by the authors.

the country. In this context, the creation of quality management systems for educational services in educational institutions, the provision of targeted support to gifted children and children from low-income families, the provision of support to young scientists, the creation of regional scientific centers will have positive results;

- price restrictions on the products of natural monopolies;
- to contribute to the increase of aggregate demand by conducting an active social policy, a policy of income redistribution of broad segments of the population through budgetary mechanisms;
- with the help of tax benefits, preferences, the creation of organizational conditions, budget expenditures, to promote the creation of jobs in rural areas and areas affected by military actions, influencing the labor market of the relevant territories in order to reduce the level of unemployment and prevent the depopulation of territories.

Among the directions for reducing the depopulation, it is advisable to single out the following. Firstly, it is socio-economic - in order to increase the birth rate, it is necessary to raise social standards in terms of incomes of the population, increase real wages, and implement housing construc-

tion financing programs. Secondly, to use disease prevention mechanisms, to form a careful attitude of the population of Ukraine towards the resources consumed, in particular water resources promote a healthy lifestyle at the state level (Burkert Carola *et al.*, 2022). Thirdly, with the help of the sphere of education, culture and the use of mass media, to form the need for a large family, to promote traditional family values.

Reducing external migration and balancing the labor market are interrelated processes. One of the prerequisites for the return of military migrants is a developed labor market and the availability of vacancies. The next condition is the availability of housing, prices for consumer goods and utilities. But the most important condition for reducing external migration is security guarantees, political and economic stability.

5. DISCUSSION

We consider relevant study (Urbaniec M., 2022a), which focus on the European labor market. The studies analyzed how digital transformation affects changes in the relationship between the employee and the employer. The implications

include changes in job security and flexibility, as well as alternative work arrangements in the digital economy.

Supporting the scientific results of the authors (Urbaniec M., 2022b), it should be noted the feasibility of researching the impact of the digital economy on the dualism of the labor market and the authors' analysis of how technological progress towards a knowledge-based economy leads to an increase in the number and improvement of jobs. It is argued that successful adaptation to the digital economy depends on a number of factors, including labor market flexibility and institutional frameworks that provide workers with the upskilling or retraining needed to change jobs.

A noteworthy study (Başol Oğuz et al., 2021) identified the impact of DESI (connectivity, human capital/digital skills, use of Internet services by citizens, integration of digital technologies and digital public services) on labor market indicators (labour market insecurity, long-term unemployment, rate, employment level and personal earnings). It is determined that, as a result, digitization in the EU countries has improved labor market indicators.

Considering the relevance of research (Urbaniec M., 2022c), we would like to note the timeliness of the analysis of how the digital economy affects the segmentation of the labor market and what factors affect the development of flexible employer-employee relations. Segmentation of the labor market is considered as an effect of the introduction and increase in the use of non-typical forms of employment and work organization, which leads to various risks that significantly reduce professional stability, protection of the interests of employees, opportunities for promotion, etc.

We also consider the articles of Kovalchuk S. *et al.* (2021), Novomlynets, O. *et al.* (2023), Burlutskiy S. *et al.* (2019), Dubyna M. *et al.* (2020) to be useful for further research, within which the peculiarities of the implementation of the health-centric policy of the functioning of the health care system and labor relations are analyzed, the challenges for education in the conditions of war are investigated, and the connection between short-term fluctuations and the stages of the economic cycle is outlined.

Actual problems are considered in articles Kosach I. *et al.* (2020), Djakona A. *et al.* (2021), where the authors analyze the socio-economic expediency of state management in the context of European integration processes and reveal the dominant role of education in the development of the information economy.

Despite the available scientific research on the mentioned issues, the question of the role of digital technologies in balancing the labor market in the conditions of post-war economic recovery is extremely relevant and requires further research, analysis and finding ways to solve urgent problems.

6. CONCLUSION

Balancing the labor market by increasing the number of jobs, involving the population of Ukraine in active self-defense, stimulating labor activity and entrepreneurship forms the basis of stability and is a condition for post-war economic recovery. With the further intensification of digitization and automation of business processes, there will be further modi-

fication of forms of employment with an increase in the share of remote work, the economic efficiency of which is high. Social efficiency in the perspective of remote work may decrease due to the automation of live work, creating prerequisites for reducing the number of jobs in general. When developing and implementing programs for the post-war recovery of Ukraine's economy, it is necessary to use the administrative, economic, legal, methodical, organizational-informational, psychological-agitational levers available in the arsenal of the state to reduce unemployment, implement effective programs to reduce population depopulation and external migration.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflict of interest.

AUTHORS' CONTRIBUTIONS

All authors contributed equally to the conception and design of the study.

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