UDC 331.5: 338.2: 005.31

JEL J44, J69, C60

TRENDWATCHING-DRIVEN MODELLING AND MANAGEMENT OF STRUCTURAL LABOUR MARKET IMBALANCES

Yuliia Herasymenko*

Bila Tserkva Institute of Continuous Professional Education SIHE "University of Education Management" of the NAES of Ukraine, Bila Tserkva, Ukraine ORCID iD: 0000-0002-8888-7472

Olha Komelina

National University "Yuri Kondratyuk Poltava Polytechnic", Poltava, Ukraine ORCID iD: 0000-0001-9297-4985

Yuliia Hrybovska

Bila Tserkva Institute of Continuous Professional Education SIHE "University of Education Management" of the NAES of Ukraine, Bila Tserkva, Ukraine ORCID iD: 0000-0001-5205-9045

Ilya Pakhomov

Bila Tserkva Institute of Continuous Professional Education SIHE "University of Education Management" of the NAES of Ukraine, Bila Tserkva, Ukraine ORCID iD: 0000-0002-6101-9384

*Corresponding author: E-mail: gerasimenkou04@gmail.com

Introduction. In the context of the crisis of the Ukrainian economy, which was significantly exacerbated by labour market imbalances, institutional structures and businesses need to promptly identify asymmetries of labour market factors and relevant results of trendwatching of the market situation. Simultaneously, trendwatching is significantly complicated by uncertainty and sharp changes in the main indicators of demand and supply in the Ukrainian labour market. This necessitates the development

of a new mathematical model of trendwatching that is suitable for use in the specifics of the labour market and its application in forecasting the indicators of the specified market.

Aim and tasks. This study aims to develop new mathematical tools for trendwatching, adapted to the conditions of Ukraine, and their use for assessing and forecasting labour market indicators.

Results. Forecasting the impact of the main factors on the labour market of Ukraine, contributing to the increase in wages in the IT industry, using the developed mathematical model, indicated that the impact of uncertainty is significant, from 5% to 20%. The differences in the average monthly wage by industry tend to grow, and the forecast data for 2025 will be 1.53 times greater than the indicator for 2021. This indicates that not only the magnitude (by two or more times) but also the directions of the demand-supply vectors change per quarter, even in critical infrastructure sectors. Simultaneously, a significant loss of high-quality human resources is indicated due to the outflow of highly qualified workers abroad.

Conclusions. The labour market trendwatching indicated that the difference in the rate of change in the number of resumes in the period 2023-2024 is 12.79 times greater than the rate of change in the number of vacancies, with a concomitant low level of convergence of the nonlinear trends of the specified indicators, which is evidence of a significant gap in the demand and supply of employee competencies. This is confirmed by a significant (1.5 times higher than the EU) unemployment rate among people with higher education levels. A significant slope ratio of the linear trend of the ratio of the standard deviation of the average monthly salary by industry to its average value in the economy (4.382) confirms the trend of increasing discrepancies in the personnel shortage by industry and the post-war period. Simultaneously, a trend towards an increase in job offers with increasing wages was detected, indicating a tendency in Ukraine to abandon the policy of cheap labour.

Keywords: Trendwatching, Labour Market, Imbalance, Mathematical Model, Workforce Management.

1. Introduction.

Currently, the factor that deepens the crisis in the country's economy is the labour market imbalance. The reasons for this state of affairs existed even before the start of the hostilities in Ukraine. The consequences of this state of the labour market will also have a prolonged character in the post-war period. Assessing the flexibility and adaptability of the labour market in the face of emerging challenges is complicated not only by the lack of statistical information but also by the level of uncertainty, which causes significant differences in forecasts when using the trendwatching tool.

Complexity is also caused by the fact that traditional trendwatching methods are limited due to the permanent breakdown of functional dependencies of trends in the main parameters of the labour market. Simultaneously, the viability of the Ukrainian economy largely depends on the availability of human capital and the ability to increase and use it effectively. Therefore, institutional structures and businesses need to promptly identify asymmetries in labour market factors that threaten personnel shortage. This also increases the importance of relevant trendwatching of the market situation and its permanent monitoring and assessment.

This necessitates the development of mathematical models not only for the substantiated use of the trendwatching tool, but also for obtaining relevant results from its application, which will provide the possibility of forming reliable forecasts, early detection of threats of labour shortages, and the introduction of measures to reduce the impact of these threats on the economy of Ukraine.

2. Literature Review.

Trendwatching tools are widely used to assess global and national labour markets and identify the impact of changes on all economic entities (Jagannathan et al., 2019; Demydov et al., 2024; Zayed et al., 2022). Furthermore, the issue of ensuring the post-war recovery of Ukraine with human resources has been reflected in a significant number of academic studies (Stepura et al., 2022; Shvets et al., 2024).

However, the application of qualitative analysis approaches by scientists (Ivanova et al., 2025) and the comparison of Ukrainian labour market trends with trends inherent in the global labour market and countries with developed economies

(Sanduhei et al., 2025) do not always justify themselves in Ukraine. In addition, trend watching as a tool for resolving employment problems using the elastic unemployment approach (Créchet, 2023) does not quite coincide with Ukrainian realities. This is due to the fact that in Ukraine the factor of the size of severance payments is almost imperceptible, labor mobility is reduced by the factor of the geographical binding of job seekers to the region of their real estate location, and there is a gradual decrease in the incentive nature of wages, which contradicts the main assumptions of the elastic unemployment approach (Créchet, 2023).

Simultaneously, when determining the importance of the migration factor for the labour market of post-war Ukraine and identifying incentives for the return of internally displaced persons (Bazaluk, 2017; Bazaluk et al., 2024), even the assessment of the impact of the extension of the war on the reduction of the number of migrant returns is characterised by a significant level of uncertainty. This uncertainty is proposed to be considered using a specialised method of comparing frictional labour markets and using the Diamond-Mortensen-Pissarides model (Poschke, 2025).

However, the non-smooth and multiparametric nature of the trends of the main indicators of the Ukrainian labour market is a problem when using this approach. Researchers have introduced various mathematical models to identify trends and predict the development of the labour market and its impact on socioeconomic processes in the state. The use of differential analysis methods in the formation of mathematical models (Buiak et al., 2023) reduces the reliability of forecasts owing to the non-smooth nature of the change in functions that use the main parameters of the labour market. The forecasts of the socio-economic differentiation of society presented by Buiak et al. (2023) also do not consider that the main player in the labour market is the employee, not the employer.

The classical Beveridge curve model (Michaillat et al., 2021) in Ukrainian reality allows for the establishment of past trends in unemployment and job offers. However, with a sharp change in the main indicators, this model cannot determine with a sufficient level of relevance how the Ukrainian labour market will function in the

future. This also applies to the assessment of the labour market using the Baseline results method, since this method indicates only a onestep difference from the baseline level (Pham et al., 2023), which is insufficient for a dynamic change in the indicators of the Ukrainian labour market.

Correlation analysis is more appropriate for identifying the connection between general economic factors and those affecting the labour market (Hann et al., 2021). A change in the correlation trend over a time series indicates a decrease or increase in the imbalance of indicators. Estimating changes in income receipts by individual locations allows for the prediction of the flow of labour from region to region (Hann et al., 2021). But the application of this method is limited to a wide range of trends in the Ukrainian labour market. A review indicated that the peculiarities of the functioning of the Ukrainian labour market require the introduction of new mathematical approaches for the relevant assessment of trends, identification of directions of labour market imbalance, forecasting the negative consequences of the specified imbalance, and the development of proposals on this basis to neutralise the specified negative impacts.

3. Methodology.

This study was based on mathematical analysis methods. Thus, the application of the statistical method allowed us to identify a trend of increasing differences in average wages by industry (Fig. 1).

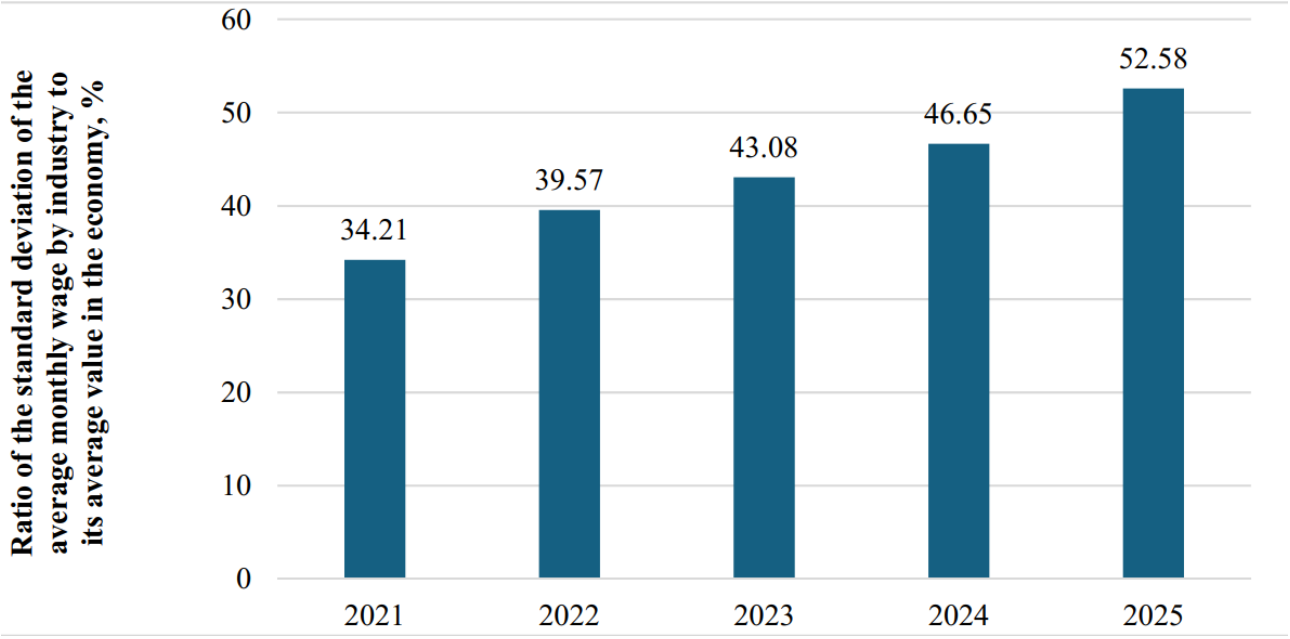

Fig. 1. Ratio of Industry Wage Standard Deviation to Economy Average, %.

Source: based on data from the State Statistics Service of Ukraine (2025).

The following function was used for this:

$$\eta = \frac{\sqrt{\frac{\sum(a - a_{\text{ind av}})^2}{n}}}{a_{\text{econ av}}}$$

where:

– η is the ratio of the standard deviation of a to the average wage in the economy;

– a is the average monthly wage in the industry;

– $a_{\text{ind av}}$ is the average value of the specified indicator in the sample with dimension n=16;

– $a_{\text{econ av}}$ is the average value of the specified indicator in the economy.

It has been established that a linear trend can describe the function defined by equation (1):

$\eta = 4{,}4a + 30{,}1$

This allowed establishing that the value of the specified function in 2025 will exceed its value in 2021 by 1.53 times. The slope ratio of the linear trend, which

determines the dynamics of the change in the specified indicator, is significant, as can be seen from equation 2, which indicates a tendency to increase the differences in personnel shortage by industry in the coming years. This also determines the flow of the working population between industries. The data analysis method identifies industries where increasing wages are used to reduce employee turnover. These are, with decreasing indicators, air transport, agriculture, construction, information and telecommunications.

A significant level of uncertainty in the main parameters significantly complicates mathematical modelling of labour market forecasts. Therefore, using vector analysis, a method is proposed for isolating A the subspace of uncertain vectors A_{unk} in the general space, which consists in the following.

Since the subspaces of probabilistic A_{prob}, fuzzy A_{fuz} and deterministic A_{det} vector parameters are part of the space A respectively, their vectors (e_1, e_2 … e_k) form a system that, when supplemented with its functions (f_{k+1}^{prob}, f_P^{prob}, μ_{k+1}^{fuz}, μ_s^{fuz}, φ_{k+1}^{det}, φ_z^{det}) forms an arbitrary basis, which will be equal to the bases A_{prob}, A_{fuz} and A_{det}. Then the dimension (N) of their intersection space will be defined as:

$$N = p + s + z - k \quad (3)$$

where p, s, z are the dimensions of the subspaces A_{prob}, A_{fuz} and A_{det} respectively, and k is the dimension of their incomplete common basis.

Vectors (e_1, e_2 … e_k) as it is known, can be considered as parameter matrices representing components of these vectors. If the transformation forms a hypercube of size $p + s + z$ then the uncertainty is insignificant or absent. Otherwise, the dimension of the kernel dim (Ker$A$) will be the defect of the transformation A, and the sum of its rank (Im) and defect (Ker) will be equal to the dimension (n) of the space A:

$$n = dim\ dim\ (Im) + dim\ dim\ (Ker) \quad (4)$$

At the same time, the difference in the dimensions of A_{prob}, A_{fuz} and A_{det} with the specified dimension of the space A will be equal to the dimension r of the uncertainty subspace A_{unc}. In this case, an arbitrary vector x of the subspace A_{unc} can be defined as:

$$x = \alpha 1x1 + \alpha 2x2 \cdots \alpha rxr \quad (5)$$

Each subsequent data set within the defined problem can be considered as invariant representations of the space A under changes in the parameter matrices of their vectors. This allows to refine ($\alpha 1$, $\alpha 2$, … αr) by the stepwise approximation method taking into account the eigenvalues of the transformations λ. This method is suitable for use in trend watching, since the labour market imbalance can be considered as a defect in the kernel of the space A as a result of a vector transformation and the combined effect of vectors (trend) can be modelled in such a way that the specified defect is minimised during the transformation.

A point of inflection of the vector function $y(t)$ in the space A exists if at least one of its projections onto the coordinate plane has differences in the left and right derivatives at this point. That is:

$$y'(t) \neq y'(t) \quad (6)$$

The sign of an extremum of a vector function $y(t)$ will be the equality of the second of at least one of its derivatives to its projections onto the coordinate plane to zero. The application of this mathematical model allowed us to assess the impact of the main factors of wage increases in the next period (Fig. 2) and establish that the main factor of influence at this time will be the pressure of competitors. This factor will exceed the second most important factor, the growth of the enterprise's income by 1.33-1.40 times. It was proven that uncertainty causes the forecast to differ by up to 20%.

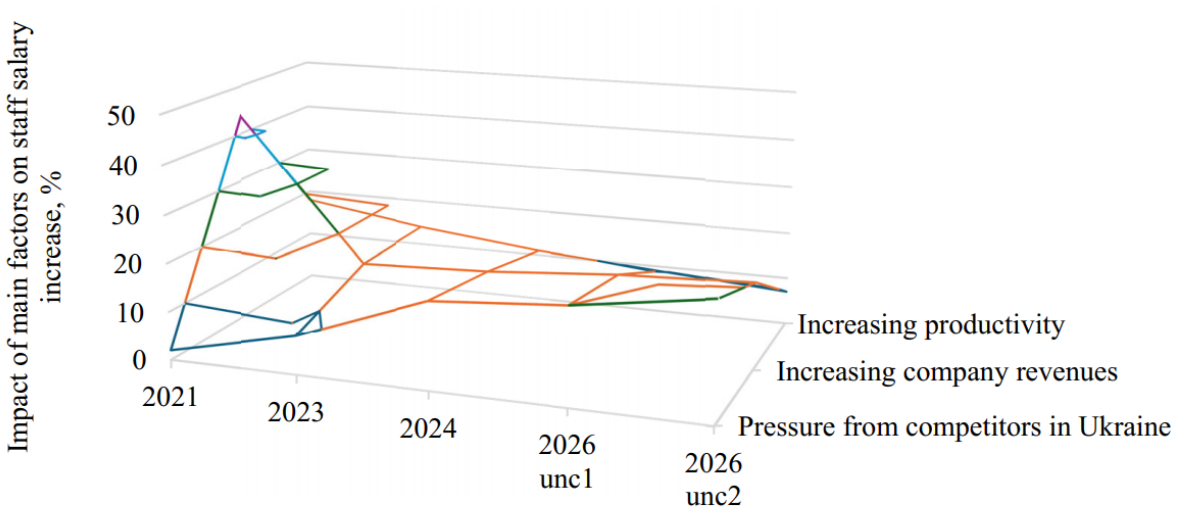

Fig. 2. Impact of Key Factors on Overall Wage Growth, %.

Source: based on WORK UA LLC (2025).

Althought they sncrease over time? Their level is mainly influenced be market conditions and changer in the national currency exchange rate? Wich is more significant for employees engaged in routine work (Fig. 3).

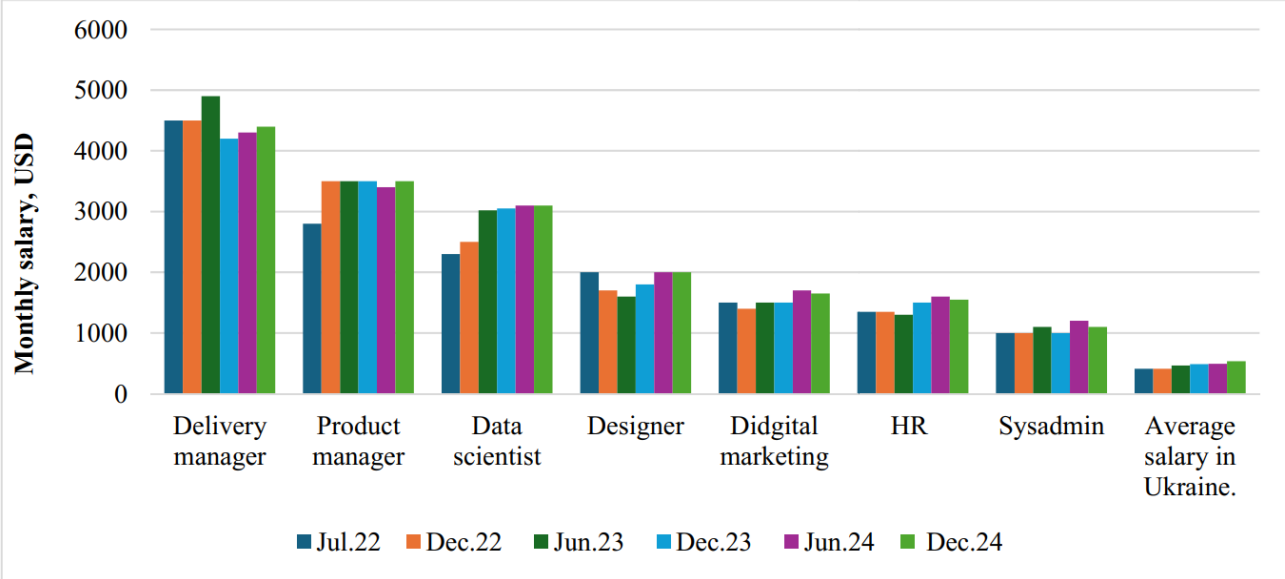

Fig.3. Dynamics of Average Mounthly Salaries in IT and the Economy of Ukraine (by category, USD).

Source: based data from Ippolitova (2024).

This market is easier to growth of salaries for IT specialists. The results of the salary forecast by specialist category for July 2026 are presented in Fig. 4.

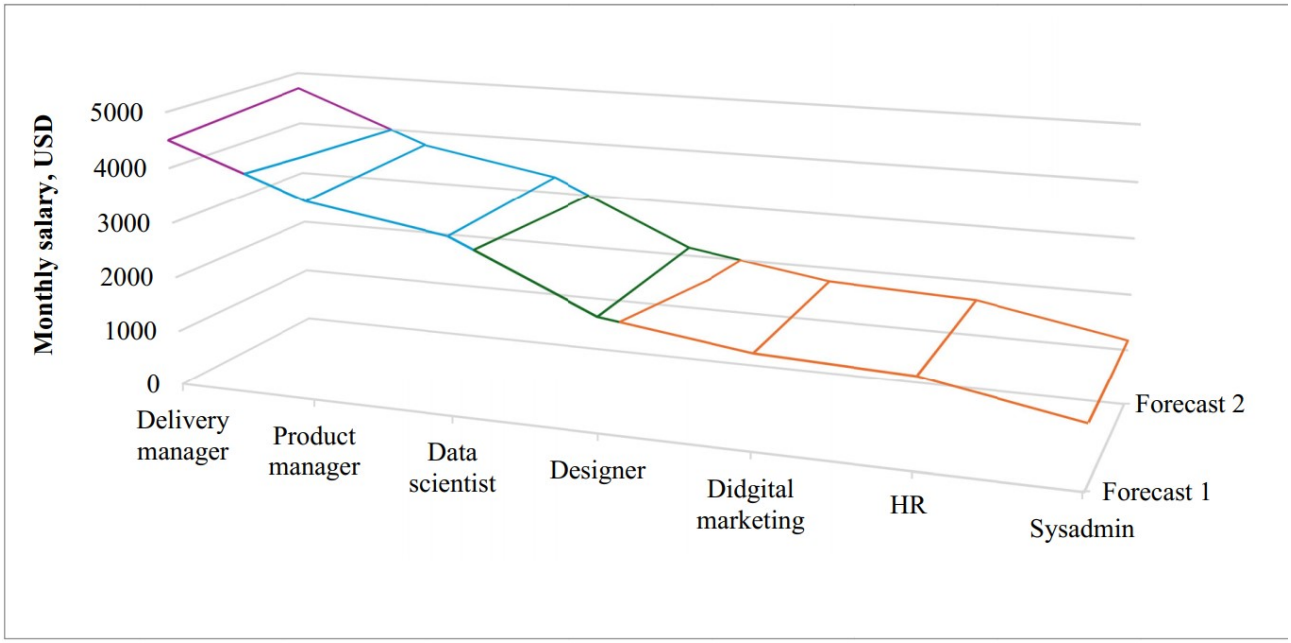

Fig. 4. Forecast salaryes in the IT-industry by specialist category for July 2026, in US dollars.

Source: based data from Ippolitova (2024).

4. Aim and Tasks.

The snude aims to develop new mathematical tools for trendwatching, adapted to the conditions of Ukraine? And their use for assessing and forecasting labour market indicators.

Consequently, the following tasks were formulated and addressed: indetifing the features of changes in labour market indicators and their impact on the relevance of traditional methods of modeling the specified market, the impact of uncertainly on the relevance of trendwatching results, and forecasting factors influencing the labour market.

5. Results

The importance of assessing the rate of change of the main indicators of the labour market in trend watching is indicated by the significant difference in the rate of the number of resumes and the number of vacancies (12.79 times) (Fig. 5).

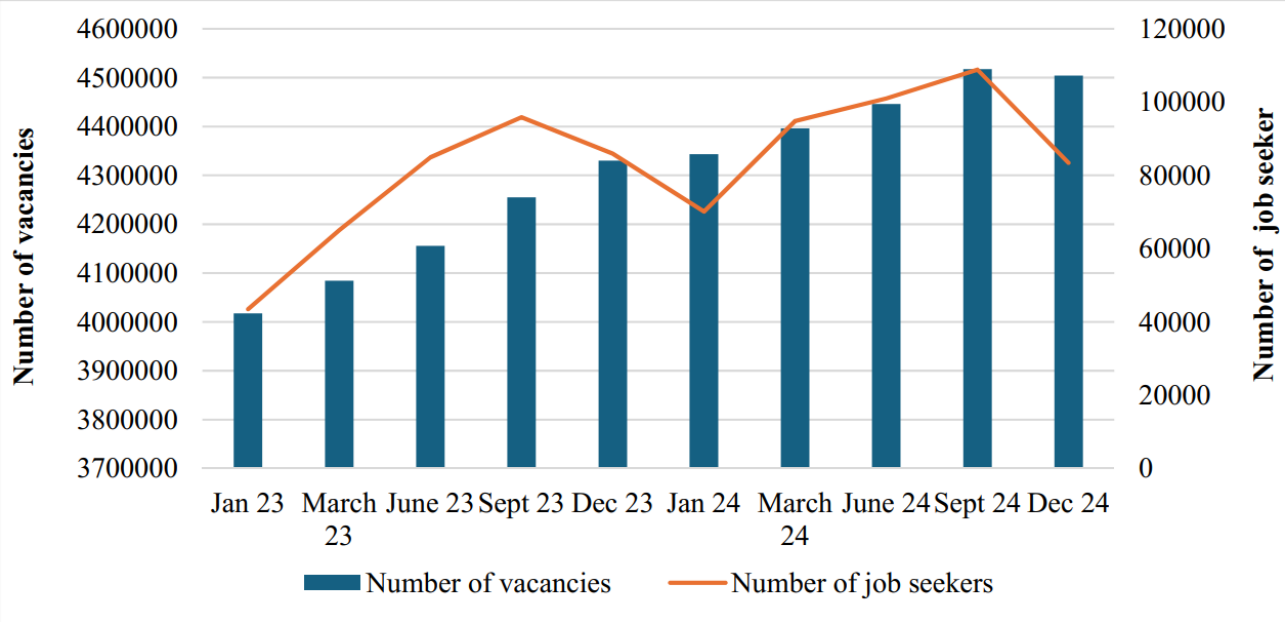

Fig. 5. Changes in the number of vacancies and resumes of job seekers over time, units.

Source: based on WORK UA LLC (2025).

This is evidence of a significant competency gap in the demand and supply of labour. According to Info Sapiens (2025), only 60% of the unemployed are actively looking for work, and less than 20% send resumes or contact employment centres. The data in Table 1 confirm the rapid change in the direction of the demand-supply vectors. This table shows the dynamics of changes in the indicator of the shortage of qualified personnel (ε) which was calculated by the formula:

$$\varepsilon = \frac{(\varrho_{vacancy} - \varrho_{job\ offer})}{\varrho_{job\ offer}} * 100 \quad (7)$$

This enables identification of imbalances in labour supply and demand in critical infrastructure sectors and highlight significant risks of instability in the supply of resources to communities due to the provision of personnel for vital sectors.

Table 1. Changes in Skilled Labour Deficit in Critical Infrastructure Sectors, %.

Subsector	01.01.24	01.07.24	01.01.25	01.04.25
Electricity generation	28.30	57.47	39.47	80.28
Electricity distribution	-23.66	8.45	-31.62	-20.90
Distribution of gaseous fuels	-47.94	-0.27	0.59	18.53
Supply of steam, hot water and air-conditioned air	18.79	-31.59	15.63	10.41

Source: based on data from the State Employment Center (2025).

The data presented in Table 1 also indicate that it is impossible for a potential employee to acquire the required qualification level in a short period after a vacancy appears in the labour market. This places the employer under the obligation of systematic training and retraining of the personnel. The conclusion of trendwatching based on these numbers of jobs and applicants for them is that the differences between them will grow not only shortly. However, it will also significantly increase in the post-war period, since about one million demobilised military personnel will enter the market.

The growth of these discrepancies in the presence of signs of a shortage of personnel indicates significant disparities in the qualification requirements of employers and the labour market supply. This is due not only to the insufficient level of adaptability of job seekers, since only 9% of registered unemployed people wanted to undergo professional retraining (National Institute for Strategic Studies, 2024), but also to interregional and structural disparities in the labour market. In particular, the imbalance in the labour market is exacerbated by significant discrepancies between the requirements of employers for the experience of applicants for high-paying jobs and the availability of this experience. Thus, most employers now require 2-5 years of experience from applicants, even at the so-called “entry level”, since the increase in the complexity of the work necessitates the need

for experience. Simultaneously, to acquire this experience, the applicant must obtain a similar job. This dichotomy forms less promising career paths and causes the need to take jobs that do not correspond to the education of applicants.

This requires attention to youth employment, as this dichotomy radically reduces the motivation of young people to study. This trend should be considered, particularly when offering an internship mechanism to provide a job after its successful completion. With a certain tendency to restore the number of job offers compared to 2022, there were significant differences across regions. Thus, the number of jobs in the Zakarpattia region increased by 55% compared to 2024.

Simultaneously, this indicator was 41% lower in the Odesa region than in 2022 (WORK UA LLC, 2025). This will largely determine the difference in the regions' post-war recovery pace. Also in Ukraine there is a significant unemployment rate for people with higher education, which since 2018 has fluctuated within 8-9% of the total number of people with the appropriate level of education (Razumkov Center, 2024).

This is 1.5 times higher than the rate in the EU countries. This may be due to the direction of education that does not meet market needs and the inflated demands of job seekers for wages. There is a tendency for high-quality human resources to leave the country. For example, Ukraine ranks second among countries providing EU merchant fleets with human resources. In terms of command staff alone, more than 26,000 Ukrainian citizens are officers of the merchant fleets of EU countries (European Maritime Safety Agency, 2024).

A significant level of personnel stress characterises the war and post-war economic recovery period of 78% of employees, which is 39.2% higher than the European rate. This is not only due to increased risks but also to uncertainty in the future, the devaluation of professional prospects, and an increase in production workload. The lack of resistance of personnel to stress reduces work efficiency and causes burnout. This requires companies to implement stress management strategies. Trendwatching reveals effective approaches to addressing post-war labour market imbalances, including the following:

– Wider involvement of women in labour market sectors where men were previously preferred. If these jobs require physical effort, they must be automated. It is worth increasing the hiring of temporary workers and expanding flexible work schedules to attract women to work.

– Ensuring the acquisition of professional skills directly at the workplace

– Implementing programs for the socialisation and adaptation of war veterans, which confirms the results of trendwatching based on data analysis (LLC GRC, 2024). In 2024, the number of companies engaged in the military reintegration increased by 79.17% compared to 2023.

– Return of migrants. According to sociological research, 63% of internally displaced persons plan to return to their homes. At the same time, there is a tendency for Ukrainians to adapt to life and work overseas. Therefore, in the post-war period, resources should be allocated to improve the quality of life of Ukrainians, including increasing the average wage and rebuilding housing, ensuring working conditions according to European standards, improving medical care, and improving infrastructure.– Return of internally displaced persons (IDPs) to the employed population category, since according to data for 2024, only 38.1% of the total number of able-bodied IDPs were officially employed (Deutsche Welle, 2024).

– Imbalances in the levels of education provided and demanded by the labour market are characterised by significant dynamic change. This problem can be eliminated by establishing a corporate education system. Some production structures are already aware of this; for example, the company “ArcelorMittal Kryvyi Rih” obtained a licence for corporate education in 350 professions (ArcelorMittal, 2025).

– Flexible approaches to inclusive work. As indicated by the results of trendwatching based on data analysis (LLC GRC, 2024), the number of companies that employ disabled personnel in 2024 increased by 11.1% compared with 2023. During this period, the number of companies not paying attention to inclusiveness and barrier-free work decreased by 37%.

– Increasing the age of the economically active part of the population. The results of trendwatching indicated that the number of companies that excluded the possibility

of attracting employees over 50 years of age in 2024 decreased to 18% compared to 2023 (LLC GRC, 2024).

– Introduction of hybrid forms of work, orientation on the acquisition of crossfunctional skills by personnel, and compensation for the costs of acquiring professional competencies and skills by job applicants.

Compensation for training costs is also an effective method of long-term attraction of a quality employee to work at one enterprise (company). Simultaneously, there is a trend towards permanent training and specialisation change (LLC GRC, 2024). This trend is manifested in ultra-modern sectors of the labour market, primarily in IT, where the rapid pace of technology renewal is most noticeable. The results of trendwatching based on data analysis (WORK UA LLC, 2025) indicate that a third of employees aim to change companies within two years, and another 42% are considering this option.

Simultaneously, the long-term impact of negative factors on the labour market has led to consequences that cannot be quickly neutralised and will affect the state of the labour market in the post-war period

– Increased asymmetry of labour market factors.

– Narrowing of the field of labour application due to the limitation of economic growth rates and increased competition in the labour market, due to the instability of production chains, and due to the demobilisation of a significant number of military personnel in a short time.

– Insignificant rates of increase in the number of quality jobs.

– The formation of long-term structural unemployment due to the destruction of production chains.

– Reduction in the effectiveness of traditional motivational and stimulating factors.

– Low labour mobility of the working-age population.

– Changes in the gender and age structure of the working-age population.

– Increased importance of enforcement in employer-employee relations.

6. Conclusions.

This indicates that labour market imbalances affect a wide range of macroeconomic indicators in the country. Thus, during the research process, it was found that the correlation coefficient of the Financial Stress Index with the number of employed people was a significant negative value (-0.7572).

A trend in the ratio of the standard deviation of the average monthly wage by industry to its average value in the economy is identified, and an equation approximates this trend. This indicates that the forecast of the discrepancy in the average monthly wage by industry increases yearly and will be 1.53 times greater in 2025 than in 2021. A significant slope ratio of the linear trend (4.382) indicates a tendency to increase the discrepancy in personnel shortages by industry and the postwar period. A significant sign of an imbalance in the labour market is the difference in the rates of change of its indicators.

It is established that the value of the correlation coefficient of the number of vacancies and resumes is significant (0.7679). At the same time, the rates of change of these indicators differ. The rate of change in the number of resumes is 12.79 times lower than the rate of change in the number of vacancies. This will exacerbate the imbalance between supply and demand, requiring significant measures to eliminate the problem. This indicates that signs of a labour market imbalance are not only the magnitude (by two or more times) but also the directions of the demand and supply vectors change per quarter, even in critical infrastructure sectors.

The increase in demand for qualified personnel in a short period imposes on the employer the obligation to systematically train and retrain personnel. It is also indicated that with increasing competition for qualified personnel, employers are increasing wages for certain categories of personnel at a rate that exceeds the rate of labour productivity growth. This factor can provoke a crisis in the labour market. The industries where increasing wages are used to reduce employee turnover the most are identified: air transport, agriculture, construction, information, and telecommunications.

Forecasting the impact of the main factors contributing to the increase in wages in general in the economy and wages in the IT industry indicated that the impact of uncertainty is significant, ranging from 5% to 20%. Simultaneously, the trend towards increasing job offers with an increasing level of wages indicates a tendency in Ukraine to abandon the policy of cheap labour.

It is also indicated that the Ukrainian labour market is spreading a tendency to add not only hard but also soft skills to the qualification requirements, in particular, responsibility (92.3%), stress resistance (77.6%), ability to work in a team (72.4%), attentiveness (56.5%), and ability to permanent learning (40.7%). The dynamics of changes in the qualifications demanded by the labour market also determine the orientation towards the acquisition of cross-functional skills by personnel.

The ways to correct the post-war imbalances of the labour market are identified. At the same time, the consequences of the long-term impact of negative factors on the labour market, which cannot be quickly neutralised and will affect the state of the labour market in the post-war period, are indicated.

REFERENCES

ArcelorMittal. (2025). Metallurg Newspaper. School season without breaks for holidays. https://metalurg.online/novyny/navchalnyy-sezon-bez-pererv-na-kanikuly

Bazaluk, O. (2017). The Theory of War and Peace: The Geophilosophy of Europe. Cambridge Scholars Publishing.

Bazaluk, O., Rahman, M. A., Zayed, N. M., Faisal-E-Alam, M., Nitsenko, V., & Kucher, L. (2024). Crowdsourcing review: the crowd workers' perspective. Journal of Industrial and Business Economics, 51, 647–666. https://doi.org/10.1007/s40812-023-00295-9

Buiak, L., Hryhorkiv, M., Hryhorkiv, V., Bashutska, O., & Pryshliak, K. (2023). Computer Modeling of the Economy Dynamics of Ukraine, Taking into Account the Socio-Economic Clustering of Society. Journal of Information Technology Management, 15(4), 64-79. https://doi.org/10.22059/jitm.2023.94710

Créchet, J. (2023). Heterogeneity in labor mobility and unemployment flows across countries. European Economic Review, 155, 104441. https://doi.org/10.1016/j.euroecorev.2023.104441

Demydov, I., Sadova, U., Andrusyshyn, N., & Lutsyshyn, A. (2024). Google Cloud Services as Monitoring Tools and Prevention of Inclusion in the Rear Labor Market. In COLINS (3) (pp. 169-183). http://dx.doi.org/10.31110/COLINS/2024-3/013

Deutsche Welle. (2024). Employment of IDPs: problems and features. https://www.dw.com/uk/pracevlastuvanna-vpoproblemi-j-osoblivosti/a-68895031

European Maritime Safety Agency. (2024). EMSA Consolidated Annual Activity Report. https://www.emsa.europa.eu/publications.html

Federation of Employers of Ukraine (2024). Labor market in Ukraine: 2022 – 2023: state, trends and prospects. A study of skills needs in Ukraine during the war. https://fru.ua/images/doc/2023/ebrd_survey_20_04_23.pdf

LLC GRC. (2024). Labor Market Barometer 2024. Forecasts for 2025. GRC.ua. https://drive.google.com/file/d/195_xVW4qt5BqH5xYRQagE341vUu6LZ4X/view

Hann, R. N., Li, C., & Ogneva, M. (2021). Another look at the macroeconomic information content of aggregate earnings: Evidence from the labor market. The Accounting Review, 96(2), 365-390. https://doi.org/10.2308/TAR-2015-0564

Info Sapiens. (2025). The Ukrainian labor market during the war: retraining, business and remote work. https://www.sapiens.com.ua/ua/publication-single-page?id=358

Ippolitova, I. (2024). Salary Report: Tech & Non-Tech Summer 2024. DOU.ua. https://dou.ua/lenta/articles/salary-report-tech-nontech-summer-2024

Ivanova, N., Kuznetsova, T., & Horilyi, A. (2025). Human capital of Ukraine: challenges and opportunities. Modern Science, 1, 80-97. https://doi.org/10.62204/2336-498x-2025-1-8

Jagannathan, S., Ra, S., & Maclean, R. (2019). Dominant recent trends impacting on jobs and labor markets-An Overview. International Journal of Training Research, 17(sup1), 1-26. https://doi.org/10.1080/14480220.2019.1641292

Michaillat, P., & Saez, E. (2021). Beveridgean unemployment gap. Journal of Public Economics Plus, 2, 100009. https://doi.org/10.1016/j.pubecp.2021.100009

National Bank of Ukraine. (2024). Inflation Report. https://bank.gov.ua/ua/news/all/inflyatsiyniyzvit-kviten-2024-roku

National Institute for Strategic Studies. (2024). Main characteristics of the labor market of Ukraine in the first half of 2024. https://niss.gov.ua/doslidzhennya/sotsialna-polityka/osnovnikharakterystyky-rynku-pratsi-ukrayiny-u-pershomu

Pham, T., Talavera, O., & Wu, Z. (2023). Labor markets during war time: Evidence from online job advertisements. Journal of Comparative Economics, 51(4), 1316–1333. https://doi.org/10.1016/j.jce.2023.06.002

Poschke, M. (2025). Wage employment, unemployment and self-employment across countries. Journal of Monetary Economics, 149, 103684. https://doi.org/10.1016/j.jmoneco.2024.103684

Razumkov Center. (2024). Labor resources for post-war reconstruction of Ukraine: status, problems, ways to solution. https://razumkov.org.ua/images/2024/10/16/2024-PyshchulinaTRUDJVI-RESURS-UKR-SAIT.pdf

Sanduhei, V., Bila, I., Shevchenko, O., Manzhula, I., & Iliukhina, V. (2025). Human capital as a driver of the formation of Ukraine's competitive advantages in the post-war period. Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu, 1, 157-163. https://doi.org/10.33271/nvngu/2025-1/157

Shvets, D., Pyvovar, M., Oleksiv, I., Zhyravetskyy, T., & Marych, N. (2024). State policy in the field of employment: legal problems and prospects in the conditions of martial law. Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu, 2, 185-193. https://doi.org/10.33271/nvngu/2024-2/185

State Employment Center. (2025). Number of vacancies and number of job seekers registered with the State Employment Service. https://old.dcz.gov.ua/storinka/analityka-ta-statystyka

State Statistics Service of Ukraine. (2025). Average monthly wage by type of economic activity per quarter. https://www.ukrstat.gov.ua/

Stepura, T., Nagornyak, T., Lypchuk, V., & Sadova, U. (2022). Migration-caused qualitative changes in human potential of the states in the territorial migration labour market "Ukraine–Poland–Germany". European Journal of Transformation Studies, 10(1), 112-137. https://czasopisma.bg.ug.edu.pl/index.php/journal-transformation/article/view/7328

WORK UA LLC. (2025). Salary statistics and job postings in Ukraine. Work.ua. https://www.work.ua/stat/count/?time=year2024&quantity=1

Zayed, N.M., Rashid, M.M., Darwish, S., Faisal-E-Alam, M., Nitsenko, V., & Islam, K.M.A. (2022). The Power of Compensation System (CS) on Employee Satisfaction (ES): The Mediating Role of Employee Motivation (EM). Economies, 10, 290. https://doi.org/10.3390/economies10110290