

“Resilience of Ukraine’s regional labour markets in conditions of full-scale war”

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RESILIENCE OF UKRAINE'S REGIONAL LABOUR MARKETS IN CONDITIONS OF FULL-SCALE WAR

Abstract

The full-scale Russian invasion has profoundly transformed Ukraine's regional labour markets, making the capacity of these markets to withstand shocks, adapt, and recover highly relevant to the design of evidence-based employment policy. The article assesses the resilience of Ukraine's regional labour markets under conditions of full-scale war and identifies patterns of their territorial differentiation. To this end, an original composite methodology combining quantitative and qualitative approaches was developed. The study examines the processes by which regional labour market resilience is formed and sustained under crisis conditions. The methodology combines quantitative and qualitative approaches: a system of 11 adjusted indicators is constructed (business activity, entrepreneurship, investment, employment, performance of employment services, and institutional support), with weighting coefficients determined through an expert survey of 24 specialists; normalised partial indices and an integrated composite resilience index are calculated, followed by a cluster analysis of the regions. Calculating the composite index for 25 regions based on 2023 data reveals significant territorial differentiation: the highest resilience is demonstrated by Rivne (0.748), Ivano-Frankivsk (0.708), and Poltava (0.697) regions, while the lowest is recorded in Luhansk (0.114), Kherson (0.285), and Zaporizhzhia (0.381) regions. The cluster analysis identifies four groups of regions and shows that proximity to the front line is not the sole determinant of labour market stability: institutional capacity and governance quality play an equally important role. Thus, the findings substantiate differentiated directions for regional employment policy and can be used by government authorities, employers, and international partners in shaping a post-war labour market recovery strategy for Ukraine.

Keywords

labour market, regional development, war economy, labour market adaptation, employment policy, human resource management

JEL Classification

J21, J60, J68, R11, R23

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РЕЗИЛЬЄНТНІСТЬ РЕГІОНАЛЬНИХ РИНКІВ ПРАЦІ УКРАЇНИ В УМОВАХ ПОВНОМАСШТАБНОЇ ВІЙНИ

Анотація

Повномасштабне російське вторгнення спричинило глибоку трансформацію регіональних ринків праці України, тому питання їхньої здатності протистояти шокам, адаптуватися й відновлюватися набуває особливої актуальності для розроблення обґрунтованої політики зайнятості. Метою статті є оцінювання резильєнтності регіональних ринків праці України в умовах повномасштабної війни та виявлення закономірностей їх територіальної диференціації; для цього розроблено авторську композитну методику, що поєднує кількісний і якісний підходи. Об'єктом дослідження є процеси формування та підтримання стійкості регіональних ринків праці в умовах кризи. Для досягнення мети застосовано комплексну методологію, що поєднує кількісний і якісний підходи: побудовано систему з 11 скоригованих показників (ділова активність, підприємництво, інвестиції, зайнятість, ефективність служб зайнятості, інституційна підтримка), вагові коефіцієнти яких визначено за результатами експертного опитування 24 фахівців; розраховано нормалізовані часткові індекси та інтегральний композитний індекс резильєнтності, а також здійснено кластерний аналіз регіонів. У результаті розрахунку композитного індексу для 25 регіонів за даними 2023 р. встановлено значну територіальну диференціацію: найвищу резильєнтність продемонстрували Рівненська (0,748), Івано-Франківська (0,708) та Полтавська (0,697) області, найнижчу – Луганська (0,114), Херсонська (0,285) та Запорізька (0,381) області. Кластерний аналіз виокремив чотири групи регіонів і показав, що близькість до лінії

фронту не є визначальним чинником стійкості: інституційна спроможність і якість управління відіграють не менш важливу роль. Таким чином, отримані результати дають змогу обґрунтувати диференційовані напрями регіональної політики зайнятості та можуть бути використані органами влади, роботодавцями й міжнародними партнерами під час формування стратегії повоєнного відновлення ринку праці.

Ключові слова

ринок праці, регіональний розвиток, воєнна економіка, адаптація ринку праці, політика зайнятості, управління персоналом

Класифікація JEL

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INTRODUCTION

The full-scale Russian invasion of Ukraine, which began in February 2022, has fundamentally disrupted regional labour markets across the country. Sustained hostilities have triggered mass population displacement, a sharp contraction in business activity, and an unprecedented restructuring of employment patterns in recent European experience. By 2023, millions of Ukrainians had become internally displaced persons, entire sectors had been suspended or relocated, and economic activity had shifted dramatically towards the western and central regions (Business Ukraine magazine, 2024; Markevich, 2022).

These disruptions have exposed substantial heterogeneity in regional capacity to absorb shocks and adapt institutional mechanisms under extreme conditions. Proximity to hostilities is an obvious explanatory factor, yet empirical evidence suggests it does not fully account for the observed variation in labour market performance: some conflict-exposed regions demonstrated greater adaptability than geographically safer territories, pointing to the independent role of institutional quality, governance, and entrepreneurial activity (Vasylytsiv & Levytska, 2023; Kravchuk et al., 2023).

Labour market resilience – understood as the capacity to withstand shocks, adapt employment structures, and recover productive activity while preserving social stability – has attracted increasing scholarly attention across contexts of economic crises, natural disasters, and structural transformations (Dobbins & Plows, 2022; Hartal et al., 2023; Diodato & Weterings, 2014). Despite this growing attention, empirical assessment of the resilience of Ukraine's regional labour markets under wartime conditions remains scarce: existing studies on the Ukrainian case are predominantly descriptive or qualitative and do not offer a regionally comparable, quantitatively grounded evaluation. Existing frameworks were developed predominantly for peacetime disruptions and do not adequately capture the compound pressures of armed conflict: infrastructure destruction, forced migration, business relocation, and institutional collapse within compressed timeframes (Baptista et al., 2024; Ding & Hirvilammi, 2024). Conducting such an assessment is critical for designing targeted employment policies and prioritising reconstruction support, yet it requires methodological tools – specifically, integrated, regionally comparable indicator systems adjusted for the data constraints inherent in active conflict zones – that peacetime-oriented frameworks do not provide.

This study assesses the resilience of labour markets across Ukraine's 25 accessible regions under wartime conditions, using 2023 data and an original composite methodology developed for this purpose. The findings are relevant to government authorities, employers' associations, employment services, and international partners involved in shaping Ukraine's post-war recovery.

1. LITERATURE REVIEW

Labour market resilience is the capacity to absorb shocks, adapt, and recover while preserving employment and economic growth (Dobbins & Plows, 2022; Hartal et al., 2023). It encompasses

territorial, institutional, and worker-centred dimensions (Shtunder & Shkuropadska, 2024; Tobin, 2024) and is increasingly shaped by digitalisation-driven transformations in employment models (Kolot & Herasymenko, 2022).

Resilience is shaped by technological development, workforce sustainability, social protection, and policy interventions (Baptista et al., 2024; Ding & Hirvilammi, 2024). Studies highlight the effects of Industry 4.0 (Kergroach, 2017; Safronchouk et al., 2021), the influence of long-term labour market conditions (Wachter, 2020), and the importance of supporting vulnerable groups and graduates (Suleman et al., 2024; Habbal & Al Falasi, 2024). These interconnected factors operate at the economic, institutional, and social levels, providing a robust framework for understanding resilience. In wartime Ukraine, where forced displacement and business relocation have become part of everyday life, it is essential to analyse regional dynamics with clarity and context. Existing international models focus on global trends – climate change, digitalisation, demographic shifts – but fail to address critical local disruptions. The Ukrainian context calls for the incorporation of migration flows, institutional adaptation, and entrepreneurial flexibility into resilience evaluation (Kravchuk et al., 2023; Azmuk, 2024).

The war in Ukraine has deeply disrupted labour market dynamics, causing rising unemployment, migration, sectoral imbalances, and growing social risks (Cheromukhina, 2022, 2024; Azmuk, 2022, 2024). Regional disparities and industry-related challenges are highlighted by Vasylytsiv et al. (2024b), Kravchuk et al. (2023), and Podlevskyi and Komarenko (2024). Responses include business relocation, entrepreneurship support, and labour market stabilisation (Ivanenko, 2022; Gavrysh et al., 2023), alongside a growing use of digital tools (Polishchuk et al., 2022). The Ukrainian case differs from conventional resilience models (Baptista et al., 2024; Ding & Hirvilammi, 2024) due to the intensification of region-specific vulnerabilities, including infrastructure damage, population displacement, and forced business relocation. Prior studies (Cheromukhina, 2022, 2024; Azmuk, 2022, 2024; Vasylytsiv et al., 2024b) emphasise territorial polarisation, professional mismatch, rising inequality, and decentralised policy responses.

Institutional support during wartime focuses on balanced social development, market competitiveness, and digital infrastructure (Novikova & Ostafychuk, 2023; Marshavin et al., 2022). Tsymbaliuk and Shkoda (2023) explores social

partnership mechanisms and collective bargaining. The role of digital ecosystems and information support systems is examined by Hryshko (2021). Diadyk et al. (2024) present international perspectives on labour market support. Zakharova et al. (2022) analyse general labour market trends in Ukraine during the war. A complex interplay of institutional resilience, technological solutions, and responsive policies shapes regional labour market adaptation in Ukraine during wartime. Researchers emphasise the importance of decentralised governance, regional autonomy, and effective public-private partnerships in maintaining labour market functionality (Novikova & Ostafychuk, 2023; Tsymbaliuk & Shkoda, 2023). Government interventions have combined short-term employment support through wage subsidies, compensation programmes, and public job creation with longer-term strategies to strengthen structural resilience (Zakharova et al., 2022; Marshavin et al., 2022). Technological solutions, particularly digital employment services and remote learning platforms, have become essential to sustaining labour market operations amid infrastructure disruptions (Hryshko, 2021). Social dialogue mechanisms, including collective agreements and territorial pacts, have adapted to wartime needs by prioritising job protection and workforce reskilling (Tsymbaliuk & Shkoda, 2023). International experiences from crisis-affected regions also underline the value of targeted financial aid and support for microenterprise development (Diadyk et al., 2024).

Literature confirms that labour market resilience is a multidimensional construct encompassing economic, institutional, social, and territorial dimensions (Dobbins & Ploughs, 2022; Kolot & Herasymenko, 2022; Baptista et al., 2024). Resilience entails the capacity to withstand shocks and to adapt and transform in response to crises. In wartime Ukraine, specific challenges – including employment restructuring, population displacement, and regional disparities – have prompted adaptive behaviours, shaped by public policy, business relocation, and entrepreneurship (Azmuk, 2022; Cheromukhina, 2024; Vasylytsiv et al., 2024b; Podlevskyi & Komarenko, 2024).

However, empirical assessment of this resilience across Ukraine's regions remains largely absent from the literature reviewed above: existing stud-

ies on the Ukrainian case (Cheromukhina, 2022, 2024; Azmuk, 2022, 2024; Vasylytsiv et al., 2024b; Novikova & Ostafychuk, 2023; Zakharova et al., 2022) are predominantly descriptive or focus on single dimensions of resilience – employment dynamics, institutional responses, or digital infrastructure – rather than providing a regionally comparable, quantitatively grounded evaluation. Composite index approaches to resilience measurement are more developed for peacetime or natural-disaster contexts (Dobbins & Plows, 2022; Baptista et al., 2024) than for active conflict settings, and no comparable assessment currently exists for Ukraine's regions under full-scale war. Conducting such an assessment requires a wartime-adapted methodology capable of integrating economic, institutional, and social indicators under the data constraints inherent in active conflict zones – a methodology presented in the Methods section below.

Regional labour markets demonstrate resilience shaped by interconnected factors that influence their ability to withstand shocks and adapt during crises. In the context of war, key indicators have been identified through theoretical insights and empirical studies. Business Activity indicates how well enterprises can operate and adapt, with declines in enterprise numbers signalling contraction and growth suggesting recovery potential, as evidenced by changes in registered enterprises and business relocation survival rates (Azmuk, 2022; Kravchuk et al., 2023). Individual Entrepreneurship is critical to local adaptability and job creation, especially under constrained conditions. The rise in the number of individual entrepreneurs indicates grassroots economic flexibility (Cheromukhina, 2024; Azmuk, 2024). Capital Investment signals economic confidence and regional development potential. Positive dynamics reflect attractiveness for long-term projects (Habbal & Al Falasi, 2024; Gavrysh et al., 2023). Employment and Unemployment Trends demonstrate labour market stability. Core indicators include employment levels, unemployment rates, and labour migration (Perehudova, 2022; Azmuk, 2024). Labour Demand is assessed via the number of vacancies and the vacancy-to-applicant ratio. Declines point to economic stagnation (Polishchuk et al., 2022; Ivanenko, 2022). The effectiveness of Employment Services reflects

the capacity for institutional support. Indicators include the employment rate among job seekers, participation in retraining, and involvement in state programmes (Cheromukhina, 2022; NISS, 2024). Institutional and Programme Support captures policy responsiveness and the presence of employment strategies, collective agreements, and regional programmes (Novikova & Ostafychuk, 2023; Tsymbaliuk & Shkoda, 2023). Resource and Infrastructure Availability, including access to basic services and digital infrastructure, underpins both business continuity and population retention in conflict-affected regions (Haller, 2024; Diodato & Weterings, 2014; Hryshko, 2021; Kolot & Herasymenko, 2022). These factors form a comprehensive basis for evaluating regional labour market resilience during systemic shocks and support the construction of a robust, indicator-based assessment model.

2. AIMS

This study pursues a single overarching aim: to assess the resilience of Ukraine's regional labour markets under wartime conditions and to identify the patterns and determinants of their territorial differentiation, using 2023 data for 25 accessible regions. To achieve this aim, an original assessment methodology was developed and applied, comprising the following tasks: synthesising theoretical approaches to labour market resilience and identifying dimensions relevant to conflict-affected contexts; constructing a system of indicators reflecting the economic, institutional, and social dimensions of resilience, adjusted for wartime data constraints; determining indicator weights through an expert survey and calculating normalised partial and composite indices; conducting cluster analysis of regions to identify patterns of differentiation and their determinants; and deriving differentiated policy recommendations for Ukraine's post-war labour market recovery.

3. METHODS

This study develops and applies an integrated methodology for assessing the resilience of Ukraine's regional labour markets under wartime conditions, addressing the empirical assess-

ment gap identified above by providing an instrument for this assessment. The conceptual model is grounded in a multidimensional understanding of labour market resilience, integrating economic, social, institutional, technological, and territorial dimensions (Dobbins & Ploughs, 2022; Hartal et al., 2023; Kolot & Herasymenko, 2022). Economic resilience is evaluated using indicators of employment, wages, investment, and business activity. Social resilience reflects labour mobility, skills adaptation, and entrepreneurial engagement. Institutional resilience considers regional policy adaptability, social dialogue, and support mechanisms. Technological and territorial resilience account for digital service provision and interregional disparities.

The methodology combines quantitative and qualitative approaches. The quantitative component involves calculating standardised unit indices, constructing partial indices, and aggregating them into a composite index of regional labour market resilience (Table 1).

Qualitative methods include expert assessment of indicator significance. The framework draws on international and national sources (Cheromukhina, 2022; Polishchuk et al., 2022; European Commission, 2024; Yatsenko, 2024a, 2024b). The resulting toolkit reflects Ukraine's unique wartime context and provides a structured instrument for assessing and comparing regional resilience. Indicator selection is based on simplicity, clarity, and data accessibility. Weights are assigned according to policy relevance and practical impact, enabling prioritisation within employment policy. Benchmarks are defined to support regional policy improvement, while threshold values enable resilience classification and clustering. Index dynamics are analysed to monitor trends over time.

Economic activity can be measured by gross regional product and the number of registered enterprises, which indicate how well businesses adapt to challenging conditions. Employment and unemployment rates provide insight into the abil-

Table 1. Indicators for assessing the resilience of regional labour markets

Source: Authors' own research.

Indicator	Weight	Adjusted weight
Index of change in gross regional product during the study period compared to the pre-war period	0.059	–
Index of change in the number of enterprises during the study period compared to the pre-war period	0.063	0.101
Index of change in the number of individual entrepreneurs during the study period compared to the pre-war period	0.059	0.095
Index of change in capital investments during the study period compared to the pre-war period	0.057	0.091
Inclusion of employment-related measures in the regional socio-economic development program	0.055	0.088
Inclusion of employment-related measures in the territorial collective agreement	0.051	0.081
Index of change in the labour force during the study period compared to the pre-war period	0.064	–
Index of change in the number of employed persons during the study period compared to the pre-war period	0.063	–
Average monthly wage during the study period	0.067	–
Index of change in the average monthly wage during the study period compared to the pre-war period	0.063	–
Unemployment rate during the study period	0.060	–
Index of change in the number of vacancies during the study period compared to the pre-war period	0.061	0.097
Number of vacancies per job seeker at the end of the study period	0.064	0.103
Share of individuals employed through the State Employment Service among all individuals who received services	0.054	0.087
Share of individuals referred for vocational training by the State Employment Service among all individuals who received services	0.056	0.090
Number of training vouchers issued per 100 residents of the region during the study period	0.056	0.090
Share of individuals referred to public works by the State Employment Service among all individuals who received services	0.048	0.077

Note: The pre-war period used for comparison in all indicator calculations refers to official statistical data for 2021, which serves as the baseline year for assessing wartime changes.

ity to retain and create jobs, while wage changes reveal income stability. These elements are essential for addressing both internal and external migration. Indicators on vocational training and retraining reflect the flexibility of regional labour forces in response to evolving skill demands.

The expert survey conducted in February 2025 complied with established principles of research ethics. Participation was entirely voluntary; all 24 specialists were informed of the study's purpose, the nature of the data to be collected, and the intended use of the results prior to their involvement. Each expert provided informed consent before completing the assessment. Anonymity was ensured throughout: no personal identifiers were recorded for individual responses, and the data were processed only in aggregated form. The collected information was used exclusively to determine indicator weights for the composite resilience index and will not be shared with third parties. No institutional review board approval was required under applicable national guidelines for non-interventional expert surveys of this type; however, the study adhered to the ethical standards outlined in the COPE Guidelines on Good Publication Practice.

Experts assessed the significance of each indicator on a scale of 0 to 5. Their characteristics are summarised in Table 2. The results were used to determine the weighting coefficients for the composite resilience index.

To calculate the composite index of resilience in regional labour markets, the normalised (unit) indices for each indicator are determined. The unit indices (I_i) are calculated using different methods for different indicators. For the indicators «presence of employment-related measures in the regional socio-economic development program» and «presence of

employment-related measures in the territorial collective agreement», I_i are defined as follows: if the regional socio-economic development program or territorial collective agreement does not include employment-related measures, I_i is assigned a value of 0; if the program or agreement does include such measures, I_i is assigned a value of 1. This method effectively incorporates institutional factors into the composite index while ensuring methodological consistency across various data types. For the remaining indicators, the calculation of I_i utilises standardisation procedures tailored to the specific characteristics of each indicator:

For indicators with higher values that reflect better performance across regions (e.g., the dynamics of the economically active population during the study period compared to the pre-war period, or the average monthly wage during the study period), unit indices are calculated by formula (1).

$$I_i = \frac{[X_{actual} - X_{min}]}{[X_{max} - X_{min}]}. \quad (1)$$

For indicators with lower values that reflect better performance (e.g., the unemployment rate during the study period), unit indices are calculated by formula (2):

$$I_i = \frac{[X_{actual} - X_{max}]}{[X_{min} - X_{max}]}, \quad (2)$$

where X_{actual} – the actual value of a given indicator for a particular region; X_{min} – the minimum value of the indicator across all regions; X_{max} – the maximum value of the indicator across all regions.

The composite resilience index of regional labour markets (K) is calculated using the following formula (3):

Table 2. Characteristics of experts

Source: Compiled by the authors based on their own research.

Characteristic	Profession		Academic status			Degree			Work experience		
	Researcher	Specialist	Professor	Associate Professor	None	DSc	PhD	None	Up to 10 years	From 10 to 20 years	More than 20 years
Number of experts (persons)	21	3	3	16	5	3	18	3	1	10	13
Share (%)	87.5	12.5	12.5	66.7	20.8	12.5	75.0	12.5	4.2	41.7	54.2

$$K = \sum_{i=1}^n I_i \cdot \alpha_i, \quad (3)$$

where I_i – standardised index for the i -th indicator; α_i – weight coefficient assigned to the i -th indicator; n – total number of indicators.

The value of the composite resilience index (K) ranges from 0 to 1, with higher values indicating greater labour market resilience in a given region.

The defined ranges for interpreting the composite resilience index are as follows: formula (4):

$$\text{If } K \in \left\{ \begin{array}{l} [0,8; 1] \\ [0,6; 0,8) \\ [0,4; 0,6) \\ [0,2; 0,4) \\ [0; 0,2) \end{array} \right\}, \quad (4)$$

$$K \in \left\{ \begin{array}{l} \text{high level} \\ \text{above - average level} \\ \text{average level} \\ \text{below - average level} \\ \text{low level} \end{array} \right\}.$$

The following information sources were used for data collection: data provided by the State Statistics Service of Ukraine and the State Employment Service of Ukraine, and information extracted from policy documents (regional socio-economic development programmes) and territorial collective bargaining agreements.

During the data collection phase, it was found that, due to the full-scale invasion in 2022, official statistical data were unavailable for several key indicators. In particular, the following indicators were excluded from analysis due to the absence of post-2021 data: the index of change in gross regional product compared with 2021; the index of change in the labour force; the index of change in the number of employed persons; the average monthly wage; the index of change in the average monthly salary; and the unemployment rate. In light of these limitations, the composite index was recalibrated by adjusting the weight coefficients of the remaining indicators, as detailed in Table 1. At

the time of the study, statistical data for several indicators for the year 2024 were unavailable; therefore, the resilience of regional labour markets was assessed using data for 2023.

4. RESULTS

The wartime dynamics of regional labour markets in Ukraine reveal substantial territorial disparities driven by hostilities, population displacement, and business relocation. Resilience across regions is shaped by business activity, investment, employment, institutional support, and infrastructure trends.

4.1. Business and entrepreneurship activity

In 2023, the number of enterprises declined nationwide, with the most severe reductions in Luhansk (–79.9%), Kherson (–62.8%), Donetsk (–53.3%), and Zaporizhzhia (–32.8%). By contrast, enterprise growth was recorded in 16 regions, mainly in western Ukraine and the Kyiv region, driven by relocation from conflict zones. A similar pattern emerged among individual entrepreneurs. By 2023, their number exceeded pre-war levels in most regions, with Lviv, Volyn, Kyiv, and Rivne leading in growth. The simplicity of business registration supports this trend.

4.2. Investment activity

Capital investment declined overall, but increased in four regions: Rivne (+61.8%), Zakarpattia (+24.2%), Chernihiv (+14.8%), and Ivano-Frankivsk (+0.3%). Notably, Chernihiv showed resilience despite early occupation. Some western regions, such as Chernivtsi and Lviv, also experienced moderate declines. The sharpest drops occurred in war-affected regions: Luhansk (–96.8%), Kherson (–91.4%), Donetsk (–80.7%), and Zaporizhzhia (–68.4%).

4.3. Employment and labour demand

All regions recorded declines in vacancies between 2021 and 2023. The most acute shortages were in the east: in Luhansk, one vacancy served 392 job seekers. Western regions saw smaller declines and higher demand: labour demand exceeded supply

by 2.1 times in Lviv, driven by business inflows and migration. Regional programmes addressed employment issues through job creation incentives, youth employment support, and career services.

4.4. Performance of employment services

In 2023, the highest job placement rates via employment services were in Rivne (37.3%), Ivano-Frankivsk (33.7%), and Lviv (31.9%); the lowest in Kherson (4.5%) and Luhansk (6.4%). Demand for vocational training was high in Donetsk and Rivne, while voucher-based upskilling programmes were most used in Poltava and Sumy, particularly in psychology and nursing. Community work programmes supported the unemployed in Chernihiv, Donetsk, Kharkiv, and Poltava.

4.5. Institutional support and regional programmes

Ukraine's institutional labour market framework demonstrated adaptability through social dialogue and decentralisation (Tsymbaliuk & Shkoda, 2023). Regional development programmes commonly include employment components, such as job preservation, reskilling, and youth initiatives (Kouskoura et al., 2024). Territorial collective agreements reinforce commitments to labour protection and recovery measures.

4.6. Infrastructure and resources

Infrastructure integrity strongly correlates with regional labour market performance. Regions with functioning transport, digital networks, and administrative capacity attracted businesses and supported employment (Gavrysh et al., 2023; Podlevskyi & Komarenko, 2024). Administrative flexibility and resource availability were essential for integrating displaced workers and restoring local economies (Azmuk, 2024; Ivanenko, 2022).

Regional labour market resilience in wartime Ukraine reflects the interplay of economic activity, institutional readiness, public support programmes, and infrastructure capacity, with western and central regions showing stronger adaptability and recovery trends. Using the composite methodology described above, the resilience of

Ukraine's regional labour markets was assessed using a set of selected indicators. The baseline data for calculating the composite indicator of regional labour market resilience are presented in the Supplementary Materials (Table A1). The calculation of individual resilience indices for regional labour markets in the studied regions is provided in the Supplementary Materials (Table A2).

The calculation of individual indices revealed notable regional strengths across specific indicators in 2023. The Lviv region demonstrated the strongest growth in business activity, reflected in rising numbers of enterprises and sole proprietors. This shift largely reflects the relocation of businesses from war-affected areas. As a result, the Lviv region also shows one of the highest ratios of job vacancies to job seekers, indicating growing demand for labour and economic activity. The Rivne region demonstrated leadership in capital investment growth and in facilitating employment through the State Employment Service, indicating a strong investment appeal and effective institutional support. Although no region showed growth in total vacancies relative to pre-war levels, the Ternopil region recorded the smallest decline, suggesting relative resilience in labour demand. The Donetsk region led in the share of individuals directed to vocational training, while Poltava had the highest number of training vouchers issued per capita, reflecting active investment in human capital. The Chernihiv region had the highest participation in community work, demonstrating effective mobilisation of available labour under constrained conditions. While all regions maintain territorial collective agreements, the presence and quality of regional socio-economic development programmes remain uneven. Expanding and improving such programmes is essential for tailoring employment policies to regional needs and capacities.

The composite indices of resilience for regional labour markets in the studied regions are presented in the Supplementary Materials (Table A3). The ranking of Ukrainian regions by the level of resilience of regional labour markets in 2023 is presented in Table 3.

The results of the composite resilience index calculation revealed significant territorial variation in the resilience of regional labour markets

Table 3. Ranking of Ukrainian regions by the level of resilience of regional labour markets in 2023

Source: Compiled by the authors.

Rank	Region	Macroregion	Composite Resilience Index
1	Rivne	Western	0.748
2	Ivano-Frankivsk	Western	0.708
3	Poltava	Central	0.697
4	Lviv	Western	0.689
5	Chernihiv	Northern	0.688
6	Kyiv	Northern	0.656
7	Chernivtsi	Western	0.608
8	Ternopil	Western	0.600
9	Zakarpattia	Western	0.598
10	Zhytomyr	Northern	0.597
11	Kirovohrad	Central	0.596
12	Dnipropetrovsk	Eastern	0.598
13	Vinnitsia	Central	0.584
14	Kharkiv	Eastern	0.568
15	Sumy	Northern	0.561
16	Cherkasy	Central	0.552
17	Volyn	Western	0.542
18	Donetsk	Eastern	0.534
19	Odesa	Southern	0.504
20	Khmelnitskyi	Western	0.463
21	Mykolaiv	Southern	0.429
22	Zaporizhzhia	Eastern	0.381
23	Kherson	Southern	0.285
24	Luhansk	Eastern	0.114

in Ukraine during the war in 2023 (Table 3). The highest levels of labour market resilience were demonstrated by the Rivne, Ivano-Frankivsk, Poltava, Lviv, and Chernihiv regions. These regions combined favourable business activity dynamics, growing individual entrepreneurship, investment attractiveness, and effective functioning of employment support institutions.

Western regions dominate the top positions in the ranking due to a combination of relative security, business relocation, and institutional capacity to support employment. The Rivne region ranked first with a composite index of 0.748, reflecting the highest investment growth and the best employment performance indicators provided by the State Employment Service. Ivano-Frankivsk region (0.708) and Lviv region (0.689) also demonstrated strong resilience, benefiting from business relocation and labour market revitalisation.

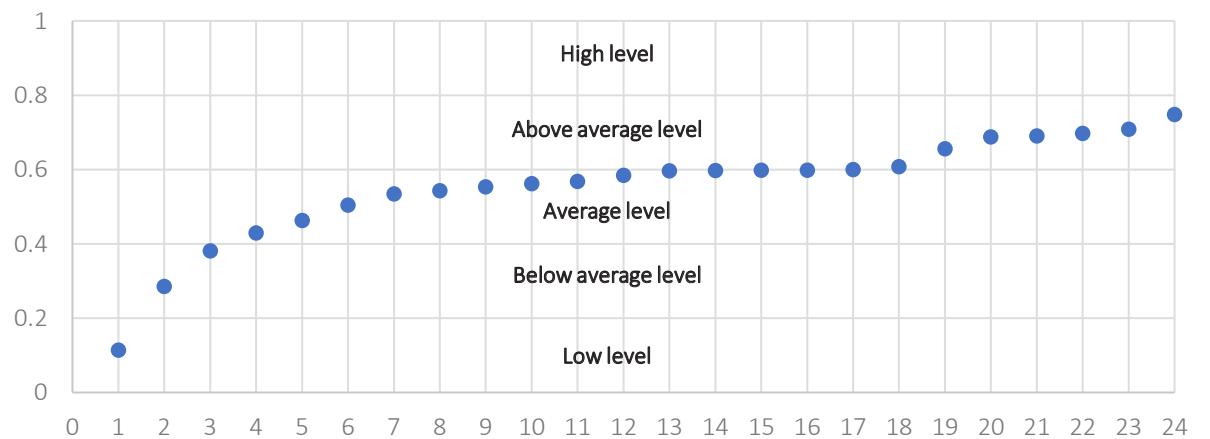
Poltava region, which ranked third (0.697) despite its relative proximity to active conflict zones, illustrates the positive impact of well-targeted local policies that support business growth, entre-

preneurship, and skills development. Similarly, the Chernihiv region, despite suffering severe destruction early in the war, showed notable resilience and ranked among the leading regions in recovery and institutional response. This situation highlights the effectiveness of recovery initiatives and the adaptability of institutions in strengthening the labour market, even in the face of extreme challenges.

Regions with a medium level of resilience are represented across all macroregions of Ukraine – eastern, southern, central, northern, and western – indicating that factors influencing labour market resilience are multidimensional and region-specific. The Kharkiv and Sumy regions, despite their proximity to the front line, have performed better than some regions considered relatively safer, such as Volyn and Khmelnytskyi. This trend highlights their robust economic capacity and resilience in adapting to challenging circumstances.

The lowest levels of labour market resilience were observed in Ukraine's southern and eastern regions, which were most severely affected by the war:

Source: Developed by the authors.



Note: 1 – Luhansk, 2 – Kherson, 3 – Zaporizhzhia, 4 – Mykolaiv, 5 – Khmelnytskyi, 6 – Odesa, 7 – Donetsk, 8 – Volyn, 9 – Cherkasy, 10 – Sumy, 11 – Kharkiv, 12 – Vinnytsia, 13 – Kirovohrad, 14 – Zhytomyr, 15 – Dnipropetrovsk, 16 – Zakarpattia, 17 – Ternopil, 18 – Chernivtsi, 19 – Kyiv, 20 – Chernihiv, 21 – Lviv, 22 – Poltava, 23 – Ivano-Frankivsk, 24 – Rivne

Figure 1. Clustering of regions by the resilience of regional labour markets

Luhansk (0.114), Kherson (0.285), Zaporizhzhia (0.381), and Mykolaiv (0.429). These areas suffered extensive infrastructure damage, large-scale population displacement, and a sharp decline in business activity and employment opportunities.

The regional distribution highlights the critical importance of institutional strength, business flexibility, and efforts to retain human capital for sustaining labour markets during times of profound crisis. The variation in resilience levels across regions underscores the need for territorial employment policies tailored to local challenges, resource availability, and economic structures.

The clustering of regions by the resilience of regional labour markets is shown in Figure 1.

Cluster analysis of Ukrainian regions using the composite resilience index identified groups of regions with similar characteristics in labour market stability and adaptability under wartime conditions. The results of the clustering reflect pronounced territorial differentiation and the asymmetric impact of war-related shocks on regional labour markets. According to the assessment, four distinct regional clusters were identified (Table 4).

The clustering of Ukrainian regions by labour market resilience highlights profound territorial asymmetries shaped by war-related disruptions. Regions in Cluster I show that a combination of institutional adaptability, investment inflows, and inclusive employment policies can sustain labour market functioning during a crisis. In contrast,

Table 4. Clusters of Ukrainian regions by the labour market resilience level

Source: Author’s elaboration.

Cluster	Resilience Level	Index Range	Regions	Key Characteristics
I	High	0.65 – 0.75	Rivne, Ivano-Frankivsk, Poltava, Lviv, Chernihiv	Dynamic business activity, high investment levels, strong employment support institutions, and effective integration of IDPs
II	Medium-High	0.55 – 0.65	Kyiv, Ternopil, Zakarpattia, Chernivtsi	Moderate business development, active vocational training programs, stable employment conditions
III	Medium-Low	0.45 – 0.55	Vinnytsia, Volyn, Zhytomyr, Kirovohrad, Sumy, Dnipropetrovsk, Cherkasy, Kharkiv, Khmelnytskyi, Donetsk, Odesa, Chernivtsi	Limited investment, weaker business relocation impact, lower institutional support, basic labour market functionality maintained
IV	Low	< 0.45	Luhansk, Kherson, Zaporizhzhia, Mykolaiv	Critical infrastructure damage, depopulation, a sharp decline in business activity and employment due to proximity to active war zones

Cluster IV underscores the severe consequences of proximity to active hostilities, where systemic destruction has critically undermined economic and employment capacity. Variation across Clusters II and III indicates that medium-resilience regions retain recovery potential but require policy reinforcement. These findings confirm the need for differentiated regional strategies to strengthen resilience through targeted investments, digital infrastructure, and workforce development tailored to local challenges.

Cluster analysis confirmed pronounced regional polarisation in labour market resilience during wartime. Regions in the east and south, most affected by hostilities, occupation, and infrastructure destruction, predominantly fell into low- and below-average-resilience clusters. No region achieved high resilience. However, five western regions, two northern regions, and one central region (Poltava) formed the above-average-resilience cluster, characterised by stronger institutional adaptability and business activity.

Medium-resilience regions were the most geographically balanced, spanning all macrozones. This distribution underscores the multidimensional nature of resilience and the uneven development of economic and institutional capacity across territories. High-performing regions such as Rivne, Ivano-Frankivsk, and Poltava demonstrated effective local governance, active entrepreneurship, investment attraction, and strong employment services.

Notably, Kharkiv and Sumy, despite their proximity to the front line, outperformed some safer western and central regions (e.g., Volyn, Khmelnytskyi, Cherkasy), highlighting the importance of governance quality and population adaptability. Chernihiv also ranked among the most resilient regions, despite severe destruction in 2022, reflecting successful institutional responses.

The composite index results (Table 5) and cluster analysis (Figure 1) jointly show that resilience depends not only on geographic exposure to conflict but also on local institutional effectiveness, the implementation of employment policy, and support for entrepreneurship. Regions with low resilience require targeted measures – including in-

vestment promotion, infrastructure renewal, and social protection – to prevent long-term degradation of labour market capacity.

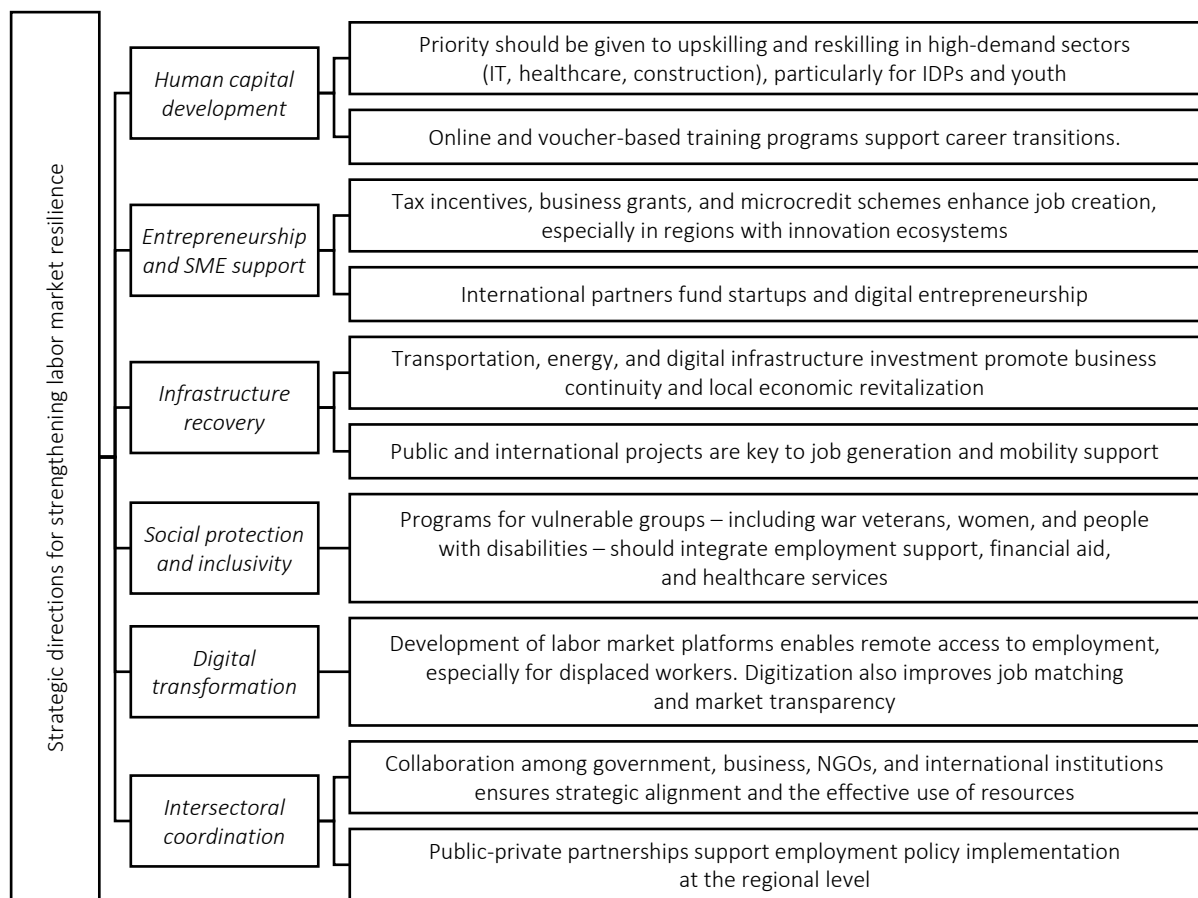
These findings emphasise the need for a differentiated regional policy framework that accounts for territorial disparities and strengthens institutional resilience in vulnerable regions. The following section critically examines these results in the context of existing theoretical models and international practice, offering insights for Ukraine's post-war recovery strategy.

Strengthening regional labour market resilience under wartime conditions requires a coordinated, multidimensional strategy. Six interconnected priorities have been identified: SME development through microcredit, tax incentives, and business grants; vocational training and reskilling in high-demand fields, with particular attention to IDPs; digital transformation enabling remote work and alternative employment; infrastructure investment supporting business relocation and continuity; social protection for vulnerable groups, including financial, healthcare, and psychosocial support; and interregional and international cooperation facilitating financial assistance and knowledge exchange. Strategic priorities and expected outcomes are summarised in Table 5.

Effective implementation requires coordinated action across regional authorities, businesses, and NGOs, tailored to local conditions. The Ukrainian government plays a central role through employment policy, support for vulnerable groups, and institutional adaptation, with priorities centred on job retention, promoting self-employment, and expanding public-private employment services (Vasylytsiv et al., 2024a; Kravchuk et al., 2023; Cheromukhina, 2022; Hryshko, 2021). International organisations contribute through financial aid, technical support, and the promotion of foreign investment, all of which are essential for modernisation and job creation (Novikova & Ostafychuk, 2023; Marshavin et al., 2022). Core strategic directions are illustrated in Figure 2.

Table A4 in the Supplementary Materials summarises the author's proposition regarding the main policy tools and opportunities to stabilise Ukraine's labour market. In summary, labour

Source: Developed by the authors.

**Figure 2.** Core strategic directions for strengthening labour market resilience**Table 5.** Strategic pillars for strengthening labour market resilience

Source: Upplemented by the authors.

Strategic Component	Implementation Mechanisms	Expected Outcomes	Priority Level
SMEs Development	Microcredit programs, tax incentives, business grants	Job creation, economic stability	High
Professional Training	Online courses, sector-specific programs, vocational training	Workforce adaptability, skill enhancement	High
Digital Transformation	Process automation, digital platforms, and remote work infrastructure	Productivity improvement, market expansion	Medium
Infrastructure Development	Logistics hubs, warehouse facilities, production capacities	Business continuity, employment preservation	High
Social Support	Financial aid, healthcare services, and psychological assistance	Worker stability, workforce retention	Medium
International Cooperation	Technical assistance, knowledge exchange, and financial support	Resource access, innovation transfer	Medium

market resilience under wartime conditions depends on coordinated efforts at national and international levels. Integrating skills development, entrepreneurial support, infrastructure investment, and inclusive policy measures will build the adaptive capacity needed for long-term recovery and socio-economic stability.

5. DISCUSSION

The research confirms and expands the existing scientific discourse on the resilience of regional labour markets, particularly under armed conflict and large-scale socio-economic shocks. The results obtained in this study are consistent with previous research on

the transformation of Ukraine's labour market during the war (Azmut, 2022; Cheromukhina, 2022; Plysenko, 2022), while offering new empirical evidence of regional differentiation and factors influencing labour market resilience.

The findings confirm the conclusions of Gavrysh et al. (2023) and Atamaniuk (2024), who emphasised that the western regions of Ukraine became centres of business relocation and economic recovery. Regarding labour market resilience, the leading positions of Rivne, Ivano-Frankivsk, and Lviv regions reflect the combined effect of business relocation, increased investment attractiveness, and institutional capacity to support employment. These results are consistent with NISS (2024) data, which indicate the fastest recovery of labour market indicators in the western regions.

A notable result of this study is the high resilience index of the Poltava region, which, despite its relative proximity to the frontline, demonstrated effective adaptation strategies. This aligns with the research of Vasylytsiv et al. (2024a), who emphasised the importance of local employment policies and support for entrepreneurship in strengthening regional labour market resilience.

In contrast, the lowest resilience levels were recorded in the southern and eastern regions – Luhansk, Kherson, Zaporizhzhya, and Mykolaiv – which corresponds with previous findings by Cheromukhina (2024) and Polishchuk et al. (2022). These regions experienced the most significant destruction of infrastructure, population outflows, and suspension of business activity, confirming the critical impact of proximity to war on labour market stability (Perehudova, 2022; Plysenko, 2022).

At the same time, the results demonstrate that geographic proximity to the frontline is not the sole determinant of labour market resilience. The relatively high resilience indices of Kharkiv and Sumy regions illustrate the importance of local institutional capacity, population adaptability, and pro-

active regional policies – in line with the conclusions of Elekes et al. (2024) and Dobbins and Plows (2022) regarding the role of social dialogue and governance in regional resilience.

The study confirms the growing importance of non-traditional forms of employment (remote work, entrepreneurship, freelance work), which, according to Atamaniuk (2024) and Kulishov et al. (2024), help maintain employment amid war and limited business activity. Furthermore, the efficiency of employment services, particularly in the Rivne, Poltava, and Ivano-Frankivsk regions, indicates the effectiveness of state policy instruments aimed at labour market stabilisation, as emphasised in NISS (2024) reports.

Compared to previous research (Diodato & Weterings, 2014), this study expands the theoretical framework of labour market resilience by including institutional factors (collective agreements, regional development programs) and indicators of human capital adaptation (vocational training, training vouchers, community works), which proved to be important for Ukraine in war-time conditions.

The results support the positions of Haller (2024) and Kouskoura et al. (2024) regarding the importance of combining economic, social, demographic, and institutional factors in assessing labour market resilience. However, the Ukrainian case demonstrates the unique role of internal migration, business relocation, and the rapid adaptation of employment services under active hostilities, which differs from the experience of labour markets in European countries during crises.

Thus, the study provides new empirical evidence of the multidimensionality of labour market resilience and confirms that its strengthening in Ukraine requires a comprehensive approach – combining support for entrepreneurship, investment in human capital, infrastructure development, and strengthening institutional capacity.

CONCLUSION

This study evaluates regional labour market resilience in Ukraine from 2022 to 2023, focusing on the noticeable territorial disparities arising from war-related disruptions. The findings reveal that resilience

is influenced by several factors, such as proximity to the frontline, the strength of local institutions, effective governance, and the ability of businesses and communities to adapt.

Regions with the highest composite resilience index – Rivne (0.748), Ivano-Frankivsk (0.708), Poltava (0.697), Lviv (0.690), and Chernihiv (0.688) – combine business dynamism, entrepreneurial growth, and effective employment support. In contrast, regions most affected by occupation and infrastructure losses, such as Luhansk (0.114), Kherson (0.285), and Zaporizhzhia (0.381), demonstrated the lowest resilience.

Cluster analysis confirmed a concentration of highly resilient regions in western and northern Ukraine, while the lowest resilience levels were observed in eastern and southern Ukraine. The study builds on prior research by applying an 11-indicator framework capturing business, employment, investment, and institutional dynamics.

The results highlight the critical role of entrepreneurship, SME development, and local employment policies in enhancing adaptability. Best practices from Rivne, Ivano-Frankivsk, and Poltava offer models for replication during post-war recovery.

Future studies should explore the roles of digital infrastructure, Industry 5.0, smart governance, and long-term demographic shifts, as well as the impacts of labour migration, in shaping labour market resilience in the context of Ukraine's recovery and EU integration.

DECLARATION OF GENERATIVE AI IN THE WRITING PROCESS

The authors used Grammarly for grammar and spelling checking during the preparation of this manuscript. No generative AI tools were used for data analysis, text generation, interpretation of results, or any other substantive aspect of the research. In accordance with the journal's policy, this limited use of a grammar-checking tool does not require a full AI declaration; however, the authors disclose it in the interest of transparency.

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APPENDIX A

Table A1. Baseline Data for calculating the composite indicator of resilience of regional labour markets

Source: Compiled by the authors.

Indicators	Adjusted Weight	$X_{\max}$	$X_{\min}$
Index of change in the number of enterprises in the analysed period compared to the pre-war period	0.101	1.13	0.05
Index of change in the number of individual entrepreneurs in the analysed period compared to the pre-war period	0.095	1.16	0.18
Index of change in capital investment in the analysed period compared to the pre-war period	0.091	1.62	0.03
Availability of employment-related measures in the regional socio-economic development program	0.088	1	0
Availability of employment-related measures in the territorial collective agreement	0.081	1	0
Index of change in the number of job vacancies in the analysed period compared to the pre-war period	0.097	0.75	0
Number of vacancies per registered job seeker at the end of the analysed period	0.103	2.09	0
Share of job seekers employed through the State Employment Service among all recipients of services	0.087	37.34	4.52
Share of individuals referred to vocational training by the State Employment Service among all recipients of services	0.090	13.91	0.4
Number of training vouchers issued per 100 population in the region during the analysed period	0.090	0.11	0.02
Share of individuals referred to community work by the State Employment Service among all recipients of services	0.077	40.44	0

Note: The pre-war period used for comparison in all indicator calculations refers to official statistical data for 2021, which serves as the baseline year for assessing wartime changes.

Table A2. Individual indices of regional labour market resilience in 2023

Source: Compiled by the authors.

Regions	Indicators										
	1	2	3	4	5	6	7	8	9	10	11
Vinnitsia	0.944	0.939	0.459	1	1	0.627	0.057	0.685	0.343	0.333	0.022
Volyn	0.991	0.99	0.535	0	1	0.8	0.263	0.532	0.377	0.333	0.049
Dnipropetrovsk	0.926	0.918	0.371	1	1	0.64	0.234	0.861	0.295	0.222	0.093
Donetsk	0.389	0.316	0.101	1	1	0.507	0.029	0.728	1	0.111	0.919
Zhytomyr	0.917	0.908	0.472	1	1	0.653	0.096	0.823	0.261	0.333	0.108
Zakarpattia	0.898	0.878	0.761	1	1	0.64	0.282	0.744	0.331	0	0
Zaporizhzhia	0.574	0.51	0.182	1	1	0.24	0.019	0.196	0.013	0.333	0.204
Ivano-Frankivsk	0.963	0.969	0.61	1	1	0.88	0.124	0.888	0.764	0.444	0.127
Kyiv	0.972	0.99	0.579	1	1	0.72	0.278	0.554	0.133	0.444	0.565
Kirovohrad	0.944	0.949	0.415	1	1	0.573	0.263	0.612	0.415	0.333	0.011
Luhansk	0.139	0	0	0	1	0	0	0.059	0.156	0	0
Lviv	1	1	0.541	0	1	1.04	1	0.833	0.573	0.333	0.073
Mykolaiv	0.796	0.786	0.34	0	1	0.493	0.11	0.401	0.216	0.222	0.377
Odesa	0.852	0.827	0.302	1	1	0.64	0.163	0.318	0.223	0.111	0.079
Poltava	0.907	0.898	0.459	1	1	0.693	0.139	0.568	0.413	1	0.671
Rivne	0.972	0.969	1	1	1	0.707	0.086	1	0.891	0.333	0.3
Sumy	0.88	0.857	0.472	0	1	0.707	0.215	0.626	0.212	0.778	0.43
Ternopil	0.954	0.949	0.447	1	1	1	0.053	0.496	0.301	0.222	0.151
Kharkiv	0.787	0.765	0.377	1	1	0.453	0.024	0.415	0.343	0.444	0.764
Kherson	0.296	0.204	0.038	1	1	0.093	0.196	0	0	0.111	0.31
Khmelnytskyi	0.963	0.949	0.472	0	1	0.64	0.129	0.418	0.333	0.111	0

Table A2 (cont.). Individual indices of regional labour market resilience in 2023

Regions	Indicators										
	1	2	3	4	5	6	7	8	9	10	11
Cherkasy	0.926	0.918	0.528	1	1	0.547	0.182	0.586	0.133	0.222	0
Chernivtsi	0.926	0.908	0.503	1	1	0.88	0.139	0.558	0.281	0.444	0
Chernihiv	0.898	0.898	0.704	1	1	0.707	0.364	0.653	0.211	0.222	1

Table A3. Composite indices of regional labour market resilience in 2023

Source: Compiled by the authors.

Regions	Indicators											Composite Resilience Index
	1	2	3	4	5	6	7	8	9	10	11	
	Weighted Indices											
Vinnitsia	0.095	0.089	0.042	0.088	0.081	0.061	0.006	0.060	0.031	0.030	0.002	0.584
Volyn	0.100	0.094	0.049	0.000	0.081	0.078	0.027	0.046	0.034	0.030	0.004	0.543
Dnipropetrovsk	0.094	0.087	0.034	0.088	0.081	0.062	0.024	0.075	0.027	0.020	0.007	0.598
Donetsk	0.039	0.030	0.009	0.088	0.081	0.049	0.003	0.063	0.090	0.010	0.071	0.534
Zhytomyr	0.093	0.086	0.043	0.088	0.081	0.063	0.010	0.072	0.024	0.030	0.008	0.597
Zakarpattia	0.091	0.083	0.069	0.088	0.081	0.062	0.029	0.065	0.030	0.000	0.000	0.598
Zaporizhzhia	0.058	0.048	0.017	0.088	0.081	0.023	0.002	0.017	0.001	0.030	0.016	0.381
Ivano-Frankivsk	0.097	0.092	0.056	0.088	0.081	0.085	0.013	0.077	0.069	0.040	0.010	0.708
Kyiv	0.098	0.094	0.053	0.088	0.081	0.070	0.029	0.048	0.012	0.040	0.043	0.656
Kirovograd	0.095	0.090	0.038	0.088	0.081	0.056	0.027	0.053	0.037	0.030	0.001	0.596
Luhansk	0.014	0.000	0.000	0.000	0.081	0.000	0.000	0.005	0.014	0.000	0.000	0.114
Lviv	0.101	0.095	0.049	0.000	0.081	0.101	0.103	0.072	0.052	0.030	0.006	0.690
Mykolaiv	0.080	0.075	0.031	0.000	0.081	0.048	0.011	0.035	0.019	0.020	0.029	0.429
Odesa	0.086	0.079	0.027	0.088	0.081	0.062	0.017	0.028	0.020	0.010	0.006	0.504
Poltava	0.092	0.085	0.042	0.088	0.081	0.067	0.014	0.049	0.037	0.090	0.052	0.697
Rivne	0.098	0.092	0.091	0.088	0.081	0.069	0.009	0.087	0.080	0.030	0.023	0.748
Sumy	0.089	0.081	0.043	0.000	0.081	0.069	0.022	0.054	0.019	0.070	0.033	0.562
Ternopil	0.096	0.090	0.041	0.088	0.081	0.097	0.005	0.043	0.027	0.020	0.012	0.600
Kharkiv	0.079	0.073	0.034	0.088	0.081	0.044	0.002	0.036	0.031	0.040	0.059	0.568
Kherson	0.030	0.019	0.003	0.088	0.081	0.009	0.020	0.000	0.000	0.010	0.024	0.285
Khmelnyskyi	0.097	0.090	0.043	0.000	0.081	0.062	0.013	0.036	0.030	0.010	0.000	0.463
Cherkasy	0.094	0.087	0.048	0.088	0.081	0.053	0.019	0.051	0.012	0.020	0.000	0.553
Chernivtsi	0.094	0.086	0.046	0.088	0.081	0.085	0.014	0.049	0.025	0.040	0.000	0.608
Chernihiv	0.091	0.085	0.064	0.088	0.081	0.069	0.037	0.057	0.019	0.020	0.077	0.688

Table A4. Recommendations and opportunities for labour market stabilisation in Ukraine

Source: Supplemented by the authors

Recommendation / Opportunity	Description and Manifestations
Financial Support and Investments	- The government provides financial aid to businesses and workers through subsidies, grants, and microcredit programs, supporting SMEs to maintain operations and employment. - International organisations (e.g., World Bank, IMF, EU) allocate resources for social protection, employment support, and infrastructure development.
Social Support Programs for Workers	- National programs include unemployment benefits, social aid for displaced persons, and compensation for job losses to ensure workers' well-being. - International organisations support medical and psychological aid, training, and reskilling programs, particularly for displaced individuals.

Table A4 (cont.). Recommendations and opportunities for labour market stabilisation in ukraine

Recommendation / Opportunity	Description and Manifestations
Investments in Training and Reskilling	• Government initiatives provide workers with skills relevant to emerging sectors like IT, construction, and healthcare. • International funding supports online education and skill development, helping workers adapt to new labour market demands.
Support for Entrepreneurship and Innovation	• Tax incentives, simplified business registration, and innovation sector support foster job creation and economic growth. • International organisations provide technical assistance and grants for start-ups and innovative projects, enhancing productivity and competitiveness.
Infrastructure Recovery and Modernisation	• Government-led projects rebuild and modernise war-damaged infrastructure, generating jobs in construction and supporting stable economic functions. • International funding focuses on energy, transportation, and communication infrastructure essential for economic growth.
Strategic Planning and Coordination	• Government employment strategies guide economic recovery, attract investments and ensure legal protection. • International organisations coordinate global efforts, mobilising resources and sharing expertise for effective labour market restoration measures.
Public-Private Partnerships	• Collaboration between governments, businesses, and NGOs drives innovative employment programs and regional recovery initiatives. • Joint efforts ensure resource optimisation and equitable distribution of opportunities across regions.
Support for Vulnerable Groups	• Targeted programs assist youth, women, and displaced workers with job placement, skill-building, and financial aid. • International initiatives address systemic inequalities, promoting inclusive economic recovery.
Promotion of Digital Transformation	• Investment in digital platforms enhances job matching and labour market efficiency. • International collaborations drive the digitalisation of employment services, enabling displaced workers to access opportunities remotely.