

Labour Market Infrastructure and Regional Economic Growth: Evidence from the EU/EEA and Ukraine

Mariia ZUB

<https://orcid.org/0000-0003-0575-4074>

Khmelnytskyi National University, Ukraine

mariannaostrovskaya1984@gmail.com

Gagik SHAHNAZARYAN

<https://orcid.org/0000-0003-1573-7200>

Armenian State University of Economics, Armenia

gagikshahnazar123@gmail.com

Vusala ALIYEVA

<https://doi.org/0009-0005-8447-2316>

National Aviation Academy, Azerbaijan

vusalaaliyeva18@gmail.com

Oleg KYSLYI

<https://orcid.org/0009-0004-7842-5655>

Interregional Academy of Personnel Management, Ukraine

olegkyskyi999@gmail.com

Myroslav KHOMYAK

<https://orcid.org/0009-0002-6161-3807>

State Tax University, Ukraine

myrkhomyak256@gmail.com

Article's History

Received 5th of July, 2026; Revised 21st of August, 2026; Accepted 7th of September, 2026; Available online: 30th of September, 2026. Published as research article in the Volume XXI, Issue 4(94), 2026.

Copyright© 2026 The Author(s). This article is distributed under the terms of the license CC-BY 4.0., which permits any further distribution in any medium, provided the original work is properly cited.

Suggested Citation

Zub, M., Shahnazaryan, G., Aliyeva, V., Kyslyi, O., & Khomyak, M. (2026). Labour Market Infrastructure and Regional Economic Growth: Evidence from the EU/EEA and Ukraine. *Journal of Applied Economic Sciences*, Volume XXI, Fall, 4(94), 1319 – 1335.
[https://doi.org/10.57017/jaes.v21.4\(94\).11](https://doi.org/10.57017/jaes.v21.4(94).11)

Abstract

The effectiveness of labour market infrastructure, reflected in the structural characteristics of the labour market, such as employment and unemployment rates, is associated with economic growth, making the studied issue relevant. The aim of the study was to assess the impact of the characteristics of the labour market structure on the economic growth of countries in the European Union (EU), the European Economic Area (EEA), and regions of Ukraine.

The study employed correlation, regression, and comparative analysis. The analysis conducted at the interstate level gave grounds to conclude about the unification of the trend towards reducing working hours in favour of improving quality, which leads to economic growth. At the same time, in the context of disparate state policies, it can be stated that other traditional characteristics of the labour

market structure do not significantly affect economic growth. This can be explained by the effect of structural saturation, which, despite the institutional differences of individual countries, is characteristic of the EU/EEA states. In Ukraine, under a unified labour policy, the impact of most characteristics of the labour market structure also remains insignificant. The only statistically significant variable was the share of self-employed persons, which characterises self-employment as an adaptation mechanism in a transition economy. The higher explanatory power of the model for Ukraine also reveals the advantages of implementing an integrated policy to improve labour market efficiency. The prospect of further research is an in-depth study of the relationship between labour market infrastructure and economic growth in transition economies, including cross-regional analysis.

Keywords: labour market infrastructure, economic growth, regional development, employment; self-employment, labour productivity, transition economies.

JEL Classification: J2; J4; R1; R11; O4.

Introduction

The labour market infrastructure effectiveness is an important prerequisite for economic growth, especially in regionally differentiated economies (Lim et al., 2024; Moridian et al., 2025). In recent academic literature, the impact of both general characteristics (human capital development, quality of institutions) and structural features of the labour market on economic dynamics is actively studied (Misra et al., 2024; Mukhtar and Nawang, 2025). The structural characteristics include the unemployment rate, the employment rate, the number of hours worked, the share of self-employed and informally employed persons (Misra and Kumari, 2024; Feng et al., 2024). These indicators are able to most fully describe the main aspects of the use of labour resources and reflect the overall effectiveness of the labour market infrastructure, employment services, vocational training systems, state regulation (Fredriksson, 2021; Irandoust, 2023). So, analysing the relationship between these indicators and economic growth becomes an important academic task in view of identifying key factors of labour market infrastructure effectiveness. This will enable targeted adjustment of labour policy of regions, both at the level of individual countries within a certain macro-region and at the level of regions within one state (Kulikov et al., 2022; Zayed et al., 2022).

In this context, an important academic task is to develop an approach that can be adapted both to the analysis of macro-regions and to the analysis of regions within a single country. This will ensure comparability at different levels of spatial analysis. The approach will establish how the different institutional contexts and labour policies of individual countries affect economic performance compared to the approach implemented within a single economic space. In this study, such a comparison is made using the example of EU/EEA countries and regions of Ukraine.

The key *hypothesis* of the study is the assumption that the structural characteristics of the labour market reflect the efficiency of its infrastructure and significantly affect economic growth. The *novelty* involves a comprehensive quantitative analysis of the impact of the characteristics of the labour market structure as indicators of the effectiveness of its infrastructure on economic growth, taking into account the regional dimension. An important feature of the approach is its adaptability for both macro-regions and regions within a single country. The *aim* of the study was to assess the impact of structural characteristics of the labour market on economic growth in EU/EEA countries and regions of Ukraine. The aim involves the fulfilment of the following research objectives:

- O1: Analyse the impact of unemployment, employment, hours worked, the share of self-employed and informally employed persons on the economic growth of EU/EEA countries;
- O2: Assess the impact of unemployment, employment, hours worked, the share of self-employed and informally employed persons on the economic growth of regions of Ukraine;
- O3: Compare results at the cross-country and intra-country levels and to assess the impact of policy coherence on the efficiency of labour market infrastructure and its relationship with economic growth.

1. Literature Review

Many researchers studied the impact of human capital as the basis of the functioning of the labour market on the economic growth of countries. Widarni and Bawono (2021) used the example of Indonesia and concluded that education is one of the important mechanisms for increasing human capital, which leads to economic growth. Using the example of 83 developing countries, Sarwar et al. (2021) proved that human capital, interacting with financial development, has a positive effect on economic growth. Mabrouki (2023) proved the existence of a significant relationship between human capital criteria (education, life expectancy, population) and economic growth using the example of Scandinavian countries. On these grounds, it can be assumed that human capital is a positive factor influencing the economic growth of countries with different levels of development.

At the same time, other scientific works prove the opposite. Sultana et al. (2022) analysed the impact of human capital on economic growth using the example of 48 developed countries and 93 developing countries. The researchers proved that all aspects of human capital have a positive impact on economic growth in developing countries, while in developed countries, life expectancy slows down growth. Villela and Paredes (2022) conducted an analysis using the example of Honduras and found that human capital does not contribute to economic growth at all. The above-mentioned studies prove that the impact of human capital on economic growth varies significantly across regions and individual countries. However, the category of human capital itself is too broad to draw sufficiently applied and solid conclusions about its relationship with economic growth. This is proven by Islam and Alhamad (2023), who found that human capital does not affect economic development, and the labour force has a statistically significant impact on it. The above-mentioned studies show that the relationship between human capital and economic growth differs across countries. Therefore, this study focuses not on human capital as a whole, but on the mechanism capable of realizing its potential – the labour market and its structural characteristics.

Structural characteristics of the labour market cover labour resources and the features of their use: unemployment rate, employment, working hours, share of self-employed and informally employed. The study uses these parameters as indicators of the efficiency of the labour market infrastructure. They are a direct result of the functioning of the labour market infrastructure elements (employment services, vocational training systems, state regulation). In other words, the infrastructure creates conditions, and structural indicators reflect how effective these conditions are in ensuring the appropriate level of economic activity of the population.

The described trend is also reflected in the academic literature in the context of the impact on economic growth. Wijaya et al. (2021) using the example of Romania determined that the impact of the Human Development Index (HDI) affects economic growth through labour resources. However, the study does not cover other structural characteristics of the

labour market, the unemployment, employment, informal employment rates, etc. Therefore, the researchers' conclusions are somewhat generalized and do not allow to describe specific structural effects on the labour market. Annisa and Taher (2022) found that the labour force indicator has a positive impact on economic growth in Indonesia. However, the researchers also did not take into account the impact of unemployment, the share of self-employed and informally employed persons, which could more deeply reveal the connection between the structure of the labour market and economic growth. Nag (2024) showed how the indicative number of hours worked can affect the economic results of countries with different levels of development. However, the study lacks a more comprehensive analysis of the joint impact of the number of hours worked and other characteristics of the labour market structure.

Maestas et al. (2023) show that the slowdown in employment growth in the United States has a negative impact on economic growth. However, in this case, this is due to an aging population, so the focus of this paper is somewhat shifted from structural characteristics of the labour market to demographic changes. Uddin and Rahman (2023) analysed how corruption, unemployment, inflation, political stability, effective governance, and the rule of law affect economic growth in 79 developing countries. However, the paper mainly uses institutional variables related to the general political and economic environment, rather than the labour market itself. These studies mainly analyse either broad indicators, such as human capital, or separate labour market characteristics. As a result, the combined influence of labour market structure on economic growth remains insufficiently explored.

Zhou et al. (2023) show that the labour market structure, through its relationship with industrial structure, can affect the economic growth rate due to higher efficiency of resource allocation. However, this paper considers the example of China, which uses a unique model of state regulation and centralized management of labour flows, which makes it difficult to compare the results with other regions.

Using the example of North Macedonia, Ziberi et al. (2022) found that rising unemployment leads to economic growth, while rising employment slows it down. Khalid et al. (2021) obtained similar findings: they found a positive relationship between rising unemployment and real GDP in South Africa. These results contradict earlier studies, and their applicability in broader contexts needs to be tested using data from other countries. The reviewed studies suggest that the impact of labour market characteristics depends on the level of economic development and institutional conditions. However, studies comparing developed and transition economies using the same methodological approach remain limited.

The literature review revealed several research gaps. First, previous studies mainly examine either human capital as a broad concept or only selected labour market indicators, rather than their combined influence on economic growth. Second, most studies focus either on developed or developing economies separately, making direct comparison difficult. Third, only a limited number of studies compare labour market characteristics at different territorial levels using a unified methodological approach.

This study offers an approach adapted for both the interstate and intrastate levels, which assesses the impact of economic growth through structural indicators of the labour market. This makes it possible to compare how labour market characteristics affect economic growth in developed and transition economies, as well as to assess how the unity or fragmentation of labour policies influences labour market efficiency. The results may provide practical guidelines for improving labour policies and identifying the labour market characteristics that have the greatest impact on regional economic growth.

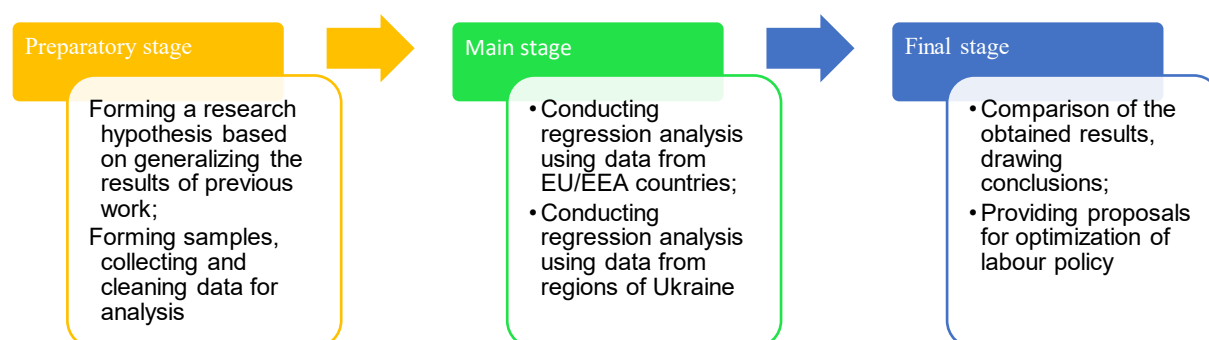
Labour Market Indicators by EU/EEA Country (2023) based on the identified research gaps, the following hypotheses were formulated:

- H1. Structural characteristics of the labour market are significantly associated with regional economic growth.
- H2. The effects of labour market structural characteristics on economic growth vary between developed and transition economies.
- H3. Self-employment has a stronger positive association with regional economic growth in transition economies than in developed economies.

2. Research Methodology

Description and justification of the research methods used. Normally, the methods will be selected from known and proven examples. In special cases the development of a method may be a key part of the research, but then this will have been described in Introduction section and reviewed in first one. The research procedure includes the following stages (Figure 1).

Figure 1: Research Design



Source: developed by the authors

The first stage involves advancing a hypothesis and collecting necessary data for its verification. The second stage is aimed at empirically testing the hypotheses and identifying the labour market characteristics associated with economic growth. The third stage was focused on comparing the obtained results at the interstate and intrastate levels.

Sample

According to the research design, a sample of indicators for the study was formed at the first stage of the research. Attention was focused on the structural characteristics of the labour market. These indicators are treated as labour market outcomes reflecting the effectiveness of labour market infrastructure rather than direct measures of the infrastructure itself. These indicators, unlike broader socio-economic indicators, made it possible to assess labour market infrastructure effectiveness through observed labour market outcomes. In other words, the chosen approach assessed the real effect of the infrastructure's operation, regardless of the regulatory or political context. The criteria for including indicators were: relevance for the analysis of the labour market structure, the possibility of using it in the analysis at the interstate and intrastate levels, and data availability.

The sample of countries for the study at the interstate level was the EU and EEA countries, and at the intrastate level – the regions of Ukraine. The final samples for the analysis (according to the latest available data – 2023 for the EU/EEA and 2021 for Ukraine) had the following form (Table 1, Table 2).

Table 1: Labour Market Indicators by EU/EEA Country, 2023

Countries	Unemployment rate	Employment rate	Hours worked per year	Self-employment, percent of total employment	Share of informal employment	GDP per capita, current dollars
Austria	5.24	4.43	1,435	12.73	0.06	56,033.57
Belgium	5.51	5.1	1,436.96	15.06	0.033	54,700.91
Bulgaria	4.3	2.9	1,617.68	11.09	0.068	15,885.54
Croatia	6.06	1.68	1,837.31	13.48	0.034	21,865.46
Czechia	2.59	5.2	1,774.17	15.98	0.168	31,591.18
Denmark	5.14	3.06	1,379.95	8.58	0.076	68,453.88
Estonia	6.34	0.68	1,742	10.52	0.091	30,133.3
Finland	7.16	2.54	1,499	13.93	0.064	52,925.69
Greece	11	4.21	1,897	37.12	0.063	23,400.73
Hungary	4.13	4.69	1,679.2	12.68	0.102	22,141.87
Iceland	3.56	0.22	1,443.65	13.67	0.014	79,636.95
Ireland	4.34	2.77	1,632.85	13.96	0.021	10,3887.8
Latvia	6.53	0.87	1,548	13.4	0.084	22,502.84
Lithuania	6.96	1.44	1,641	12.22	0.051	27,786.01
Luxembourg	5.19	0.33	1,451.82	10.69	0.103	128,678.2
Sweden	7.59	5.17	1,437	10.5	0.032	55,516.84
Norway	3.58	2.88	1,418.43	4.59	0.049	87,925.09
Poland	2.9	17	1,803	19.86	0.17	22,056.67
Portugal	6.49	5.15	1,631	15.16	0.097	27,331.21
Romania	5.59	7.64	1,825.91	23.2	0.314	18,404.27
Slovakia	5.84	2.6	1,627.12	15.01	0.163	24,491.38
Slovenia	3.63	0.99	1,616.1	13.97	0.077	32,610.11

Source: The Global Economy; World Bank

The GDP per capita indicator was a dependent variable in the subsequent analysis, characterizing the level of economic growth of the regions. Other indicators are characteristics of the labour market structure, which acted as independent variables.

Table 2: Labour Market Indicators by Ukrainian Region, 2021

Regions of Ukraine	Unemployment rate	Employment rate	Hours worked per year	Self-employment, percent of total employment	Number of informally employed population, thousands of people	GDP per capita, UAH
Vinnitsia	11.4	65.5	1,677	0.6	184.7	114,218
Volyn	13.0	56.1	1,690	0.6	105.1	90,331
Dnipropetrovsk	9.1	69.2	1,702	2.3	193.4	186,697
Donetsk	15.9	59.3	1,664	0.7	74.2	69,446
Zhytomyr	11.6	64.0	1,624	0.6	93.1	95,948
Zakarpattia	11.5	60.5	1,622	0.6	70.6	60,632
Zaporizhzhia	11.4	66.8	1,699	1.1	163.0	138,521
Ivano-Frankivsk	9.2	60.1	1,577	0.6	213.2	88,227
Kyiv	7.3	67.3	1,701	1.7	50.6	162,696
Kirovohrad	13.7	62.0	1,701	0.7	50.4	109,183
Luhansk	16.7	66.9	1,622	1.5	71.9	24,684
Lviv	7.9	65.4	1,639	1.3	99.1	119,049
Mykolaiv	11.7	67.1	1,663	0.8	166.6	112,864
Odesa	7.5	66.5	1,681	2.4	245.6	115,129
Poltava	12.8	64.5	1,699	1.2	59.5	195,825
Rivne	10.5	59.7	1,631	0.7	204.1	77,599
Sumy	10.5	67.1	1,651	0.5	83.6	100,760
Ternopil	12.3	59.4	1,634	0.7	120.5	79,412
Kharkiv	6.9	70.4	1,684	0.7	85.1	122,227
Kherson	11.9	68.0	1,688	0.5	158.2	87,378
Khmelnyskyi	10.8	63.0	1,661	0.7	92.0	96,964
Cherkasy	10.4	67.0	1,688	0.6	81.3	112,145
Chernivtsi	10.5	58.5	1,587	0.7	164.8	61,088
Chernihiv	12.9	66.7	1,659	0.5	63.9	117,225
The city of Kyiv	7.5	69.7	1707	4.2	123.9	431,616

Source: State Statistics Service of Ukraine

First of all, the described approach corresponds to the set task, assess the relationship between the coherence of regional labour policies, labour market infrastructure effectiveness, and economic growth. Second, it enables comparing the peculiarities of the functioning of labour markets of countries with different institutional environments, developed countries, and countries with economies in transition. Italy, the Netherlands, France, Germany, and Spain were excluded from the final analysis because they represented influential observations due to exceptionally high GDP per capita values relative to the rest of the sample, which substantially affected the stability of the regression estimates. A logarithmic transformation of

GDP per capita was also tested as part of a sensitivity analysis; however, it did not eliminate the influence of these observations or improve the overall model performance. Therefore, the final specification was estimated using the reduced sample.

Correlation analysis was used to analyse the indicators that characterize the strength of the relationship between variables in the constructed models. Regression analysis using the multiple linear regression showed the simultaneous influence of characteristics of the labour market structure on economic growth. The general regression formula used in the study is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n \quad (1)$$

where: Y is dependent variable (GDP per capita); $X_1, X_2, \dots, X_n$ are independent variables; β_0 – intercept; $\beta_1, \beta_2, \dots, \beta_n$ is regression coefficients.

The quality of the results was checked using tests for autocorrelation of residuals (Durbin–Watson test), multicollinearity (variance inflation factor (VIF)), heteroscedasticity (Breusch–Pagan test), normality of the distribution of residuals (Shapiro–Wilk test). Comparative analysis was used to compare results at the inter- and intra-state levels and draw conclusions about the relationship between policy coherence, labour market infrastructure effectiveness, and economic growth.

Since the analysis is based on cross-sectional data, the estimated relationships should be interpreted as statistical associations rather than definitive causal effects. In particular, potential endogeneity and reverse causality between labour market characteristics and economic growth cannot be completely excluded, as economic growth may also influence labour market outcomes.

Regression analysis was performed in Excel using the XLMiner and StatPlus add-ins, which ensured high accuracy and reliability of the obtained results.

3. Results and Discussion

In the regression analysis of the impact of labour market infrastructure efficiency indicators on economic growth of selected EU and EEA countries, GDP per capita was the dependent indicator. This indicator was used as an indicator of economic growth, which allows taking into account the country's population. Regression statistics indicate a sufficiently strong correlation between the variables included in the model (0.6863). At the same time, the explanatory power of the model according to the adjusted coefficient of determination is moderate, the variables included in the model can explain about 30.56% of the variation in economic growth. This indicates that changes in economic growth are largely determined by factors not included in the model. The results of the regression analysis for the EU/EEA countries are reported in Appendix A, Table A1.

The results of the regression analysis indicate that the unemployment rate and the employment rate are not statistically significantly associated with economic growth. The same applies to the share of self-employed persons and the share of informal employment. The number of hours worked was the only indicator that showed a statistically significant association with economic growth. This association is negative, indicating an inverse relationship between the number of hours worked and economic growth.

The obtained results can be explained by certain structural features of European labour markets, as well as by the very content of the indicators used as proxies for the efficiency of the labour market infrastructure. First of all, it is worth paying attention to the indicator with a statistically significant negative association, the number of hours worked per year. The regression coefficient for this indicator is -131.8135; thus, within the analysed sample, an increase in time worked by 1 hour is associated with an average decrease in GDP per capita of about \$131.81. Its inverse relationship with economic growth indicates that it is not the duration of work that determines efficiency, but its quality. This is consistent with the trend of reducing the duration of the working week in some developed countries, Sweden, Finland, Denmark, which are directly included in the analysis, as well as France, Germany, and the Netherlands. The reduction of the working week, along with the increase in efficiency, can be explained by the introduction of flexible employment models, technological innovations, and capital-intensive processes.

The lack of a statistically significant association of the unemployment rate, the share of self-employed persons, and the share of informally employed persons with economic growth can be explained by the rather low level of these indicators in the analysed countries. Along with this, the statistically insignificant association of the employment rate with economic growth can be explained by the limited variability of this indicator in the sample of countries. A stably high level of employment, low levels of unemployment, self-employment and informal employment can create the effect of structural saturation. In other words, the labour market structure can be defined as favourable and such that fluctuations in these indicators no longer have a significant association with economic growth. Given these conclusions, the analysis of the relationship between structural labour market indicators reflecting labour market infrastructure effectiveness and the economic growth of Ukraine as a developing economy is of particular academic interest. This will enable identifying differences in the studied relationships using the example of developed countries and countries with economies in transition, as well as identify potential directions for reforms. It is worth considering that the regression analysis for European countries was conducted at the level of national aggregated data. Accordingly, the results reflect the overall relationships between structural labour market indicators and economic growth without disaggregating them into internal regional characteristics. For Ukraine, such analysis was carried out at the regional level for a more detailed consideration of the labour market characteristics of a given country. Although this complicates direct comparison of results because of different levels of data aggregation, it does allow us to identify which indicators lose/increase their association depending on the analysis level.

An important feature revealed at the stage of regression statistics analysis is the significantly higher correlation and determination coefficients for the Ukrainian model compared to the European countries model. The correlation coefficient for the Ukrainian model was 0.8712, the explanatory power of the model according to the adjusted coefficient of determination was 69.56%. Such differences in the models can be explained by both methodological and economic factors.

From a methodological perspective, the analysis for Ukraine was carried out within one country, which reduced the impact of structural differences between countries. Accordingly, this allowed clearer relationships between structural labour market characteristics and economic growth to be identified. From an economic perspective, the studied factors may be more strongly associated with economic dynamics in a country with a transition economy

because of higher labour market instability. Appendix A, Table A2 presents the results of the regression analysis of the relationship between structural labour market indicators reflecting labour market infrastructure effectiveness and the economic growth of the regions of Ukraine.

Regression analysis using data from the regions of Ukraine showed no statistically significant association of unemployment, employment, hours worked, and informal employment with economic growth. However, it is worth noting that the unemployment rate and hours worked are approaching the threshold of statistical significance ($p < 0.05$). This indicates that these indicators may be associated with economic growth under other conditions, for example, with a more detailed sample or a different observation period. The only statistically significant indicator was the share of self-employed persons in total employment.

The share of self-employed persons has a significant positive association with the economic development of the regions of Ukraine, a 1% increase in this indicator is associated with an average increase in GDP per capita of approximately UAH 59,840.57. This may indicate that self-employment acts as an important adaptation mechanism under labour market instability and limited formal jobs. Self-employment can be an important indicator of the growth of entrepreneurial activity of the population.

Unlike in the EU/EEA countries, hours worked are positively associated with economic growth, although the statistical significance of this association is only at the $p < 0.1$ level. This means that the detected association may be random or potentially significant in other contexts or for another period. The potential presence of such an association is consistent with theoretical assumptions that in a transitional economy and insufficient labour productivity, not qualitative, but quantitative increases in labour contribute to economic growth.

The unemployment rate also approaches statistical significance and shows a negative association with economic growth. This may indicate that this indicator may also become significant in other conditions, for example, taking into account hidden unemployment. The employment rate and the share of informally employed persons are not statistically significant. However, given the high level of informal employment in Ukraine, it can be assumed that the lack of a significant association of this indicator with GDP is the result of the lack of accurate official estimates.

The obtained results give grounds to draw conclusions about the relationship between structural labour market indicators reflecting labour market infrastructure effectiveness and economic growth, as well as the relationship between policy coherence, labour market infrastructure effectiveness, and economic growth. In particular, the results allow identifying differences associated with institutional fragmentation in EU/EEA countries. Despite the predictability of the conclusion about lower policy coherence of different states compared to regions of the same country, the results revealed that the relationships between labour market characteristics and economic growth vary across different institutional environments.

The models obtained as a result of the analysis demonstrate that the characteristics of the labour market structure are associated with economic growth differently in developed countries and countries with economies in transition. In developed countries, there is an increasing focus on the quality of work with a decrease in the amount of time worked; in the unstable labour market of Ukraine, the growth of self-employment is an important adaptation mechanism.

These differences may be explained by higher institutional quality, labour productivity, and greater labour market flexibility in developed economies. Under such conditions, economic growth depends less on increasing labour inputs and more on improving labour efficiency. In contrast, transition economies are characterised by ongoing structural transformation, lower productivity, and less stable labour market institutions, making labour market adjustments an important mechanism for supporting economic activity.

The author's conclusions regarding the key role of characteristics of the labour market structure are generally confirmed by the results of other studies. Wijaya et al. (2021) proved that labour resources mediate the impact of human development on economic growth. Annisa and Taher (2022) and Islam and Alhamad (2023) confirmed the existence of a significant positive impact of labour resources on economic growth (in Indonesia and Saudi Arabia, respectively). Yerrabati (2022) and Masenya (2021) proved the existence of a positive impact of self-employment on economic growth in developing countries. The stronger role of self-employment in transition economies may also reflect limited employment opportunities in the formal sector. In such conditions, self-employment serves as a mechanism for labour market adaptation, whereas in developed economies, where formal employment is generally more stable, its contribution to economic growth is less pronounced.

The issue of increasing economic efficiency and productivity through reduced working hours due to high quality of work remains debatable. For example, Gomes (2023) emphasizes the benefits of reduced working hours (through the transition to a four-day work week), Spencer (2022) expresses doubts about the positive results. Campbell (2024) and Al Owais and Mirb (2023) show the ambiguity of the impact of reduced working hours in different contexts. These findings are consistent with the author's findings, as a significant association was noted only for developed countries.

The study identifies unemployment as a variable potentially associated with lower economic growth in developing countries. This is consistent with the findings of Hjazeen et al. (2021) and Priambodo (2021), which show a negative relationship between economic growth and unemployment (cases of Jordan and Indonesia). Uddin & Rahman (2023) also found an inverse relationship between unemployment and GDP per capita in 79 developing countries. Louail and Benarous (2021) confirmed a negative relationship using the example of Algeria.

The paper found no evidence of a statistically significant association between changes in employment rates and economic growth in developed countries. This distinguishes this paper from Maestas et al. (2023), who showed that the slowdown in employment growth due to aging has a negative impact on economic growth in the United States. The differences may be explained by the fact that this paper does not take into account broader demographic indicators, such as aging, the level of education of the population, focusing on structural characteristics of the labour market.

The author found a statistically significant negative association between the number of hours worked and economic growth in EU/EEA countries, which is inconsistent with the findings of Nag (2024). Using the example of the United States, the researchers found a positive correlation between the number of hours worked and economic growth. However, this was not confirmed for the other 65 countries included in the research.

The results of the author's study contradict the findings of Ziberi et al. (2022). The researchers found a positive correlation between increasing unemployment and economic development and a negative correlation between employment and economic development (using the example of North Macedonia). Khalid et al. (2021) also found a direct relationship

between the growth of unemployment in South Africa and real GDP. The difference in findings can be explained by the specifics of the studied regions and the existing structural imbalances in the labour market.

The validity of the author's conclusions regarding the need to analyse differences in the structural characteristics of the labour markets of developed and developing countries is confirmed by the results of other studies. Although the results of Zhou et al. (2023) have limited applicability because of the use of China's unique labour relations practice, they may be valuable for explaining the results of this study. These results indicate that the depth of transformations, a different structure of sectors, and a different speed of labour redistribution may be among the main reasons for the differences identified by the author in relation to the EU and Ukraine. Another possible explanation lies in differences in labour market policies. EU countries generally apply more coordinated employment, education, and social protection policies, whereas transition economies continue to reform labour market institutions. These differences may influence how labour market characteristics are translated into economic growth under different institutional conditions. The author's conclusions regarding the differences in the determinants of economic growth in the context of the structural characteristics of the labour market of countries with different levels of development are confirmed in the study of Sultana et al. (2022). Using the example of a wider sample that included 141 countries, the researchers found a different impact of different characteristics of human capital on the economic growth of developed and developing countries.

The obtained results provide partial support for the proposed hypotheses. H1 was only partially confirmed, as not all structural characteristics of the labour market were significantly associated with economic growth. H2 was confirmed because the relationships differed between developed and transition economies. H3 was also confirmed, as self-employment showed a stronger positive association with economic growth in Ukraine than in the EU/EEA countries. In further study, it is important to expand the analysis by including variables that characterize the quality of labour, as in the study of Fukao et al. (2021) using the example of Japan. The practical value of the results is the identified key factors influencing the labour market structure on economic growth, at the interstate level for developed countries and at the intrastate level for Ukraine. In practice, this enables assessing the effectiveness of the existing labour market infrastructure, as well as to more thoroughly shape the directions of state policy in the field of labour relations.

A limitation of the study is the use of exclusively quantitative characteristics of the labour market structure, which is determined by the need to ensure statistical comparability between the studied regions. The analysis for Ukraine is limited to pre-war data because of the lack of more current information, which is associated with the lack of opportunities for statistical organizations to collect complete data in wartime.

Recommendations (for Ukraine):

- Reorientation of labour policy from increasing the amount of working time to ensuring higher quality of work through modernization, revision of requirements for specialist competencies and motivation systems, better organization of work;
- Creation of favourable conditions for self-employed persons (simplification of registration conditions, tax incentives, access to financing, etc.);
- Study of European experience has demonstrated the existence of individual positive examples for Ukraine, such as reducing working hours in favour of improving the quality of work. At the same time, mechanical transfer of the European model, where structural factors

have a weaker influence, may be ineffective for Ukraine. This indicates the appropriateness of policy differentiation, in particular, with a focus on supporting small businesses, reducing unemployment, and encouraging the formalization of labour relations.

Conclusion

The effectiveness of labour market infrastructure contributes to the efficient use of human resources and is associated with regional economic growth. The paper analyses the relationship between labour market structural characteristics, used as outcome-based indicators of labour market infrastructure effectiveness, and economic growth. In particular, the impact of the unemployment, employment rates, number of hours worked, share of self-employed, and informally employed persons on the economic growth of the EU/EEA countries, as well as the regions of Ukraine, was determined. The analysis showed that at the EU/EEA level, the number of hours worked has a statistically significant negative impact, while at the level of the regions of Ukraine, the share of self-employed has a statistically significant positive impact.

These results show that in developed economies, traditional labour market indicators (unemployment, employment, self-employment, informal employment rates) do not have a significant impact on economic growth. It can be assumed that the structure of the labour market in the EU/EEA countries has reached such a level of stability that fluctuations in basic indicators are mostly insignificant and do not have a significant impact on the economy. A significant negative association between hours worked and economic growth may indicate a change in the efficiency paradigm, when growth is not driven by the duration of work, but by qualitative changes, automation and flexibility.

A significant positive association between self-employment and economic growth in the model for the regions of Ukraine may indicate that self-employment can play the role of an adaptation mechanism in a transitional economy. The associations for unemployment and hours worked approach the threshold of statistical significance, which may indicate their potential impact on economic growth. Unemployment has an expected negative impact on economic growth, while the number of hours worked has a positive impact, so quantitative approaches still prevail over qualitative ones in the context of a transition economy. The results provide evidence for assessing labour market infrastructure effectiveness at different territorial levels, offering a basis for more targeted labour policy formulation. The obtained results should be interpreted as statistical associations rather than evidence of causal relationships because the analysis is based on cross-sectional data. Future studies could apply panel data or longitudinal approaches to investigate causal effects more comprehensively. Further research may also focus on a deeper study of the impact of labour market infrastructure on economic dynamics in transition economies, including cross-regional analysis.

CRedit Authorship Contribution Statement

Zub, M.: Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft, Writing – review & editing. Shahnazaryan, G.: Methodology, Validation, Formal analysis, Writing – review & editing. Aliyeva, V.: Data curation, Investigation, Visualization, Writing – review & editing. Kyslyi, O.: Data curation, Software, Formal analysis, Validation, Writing – review & editing. Khomyak, M.: Investigation, Resources, Validation, Writing – review & editing.

Acknowledgments/Funding

The authors received no external funding for this research. No additional acknowledgments are applicable.

Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Data Availability Statement

The data used in this study are derived from publicly available secondary sources, including the World Bank World Development Indicators, The Global Economy database, and the State Statistics Service of Ukraine, as identified in Tables 1 and 2 and in the References. No new primary data were generated.

Ethical Approval Statement

This study relies exclusively on publicly available secondary and aggregate data and does not involve human participants, personal data, animal subjects, or experimental interventions. Therefore, ethical approval was not required.

References

- Al Owais, A., & Mirb, F. (2023). The social, economic and environmental impacts of a 4-day workweek in an organization. *Emirati Journal of Business, Economics, & Social Studies*, 2(2), 38-47. <https://doi.org/10.54878/y5mpg048>
- Annisa, N., & Taher, A. R. Y. (2022). The effect of foreign debt, labour force, and net exports on Indonesia's economic growth in period of 1986 Q1-2020 Q4. *Jurnal Ekonomi Dan Bisnis Jagaditha*, 9(1), 39-46. <https://doi.org/10.22225/jj.9.1.2022.39-46>
- Campbell, T. T. (2024). The four-day work week: A chronological, systematic review of the academic literature. *Management Review Quarterly*, 74(3), 1791-1807. <https://doi.org/10.1007/s11301-023-00347-3>
- Feng, Y., Lagakos, D., & Rauch, J. E. (2024). Unemployment and development. *The Economic Journal*, 134(658), 614-647. <https://doi.org/10.1093/ej/uead076>
- Fredriksson, D. (2021). Reducing unemployment? Examining the interplay between active labour market policies. *Social Policy & Administration*, 55(1), 1-17. <https://doi.org/10.1111/spol.12606>
- Fukao, K., Makino, T., & Settsu, T. (2021). Human capital and economic growth in Japan: 1885–2015. *Journal of Economic Surveys*, 35(3), 710-740. <https://doi.org/10.1111/joes.12419>
- Gomes, P. (2023). The recent movement towards a four-day working week. In *Global Labour in Distress, Volume II: Earnings, (In) decent Work and Institutions* (pp. 471-475). Cham: Springer. https://doi.org/10.1007/978-3-030-89265-4_22
- Hjazeen, H., Seraj, M., & Ozdeser, H. (2021). The nexus between the economic growth and unemployment in Jordan. *Future Business Journal*, 7(1), 42. <https://doi.org/10.1186/s43093-021-00088-3>
- Irandoust, M. (2023). Active labour market as an instrument to reduce unemployment. *Journal of Government and Economics*, 9, 100065. <https://doi.org/10.1016/j.jge.2023.100065>
- Islam, M. S., & Alhamad, I. A. (2023). Do personal remittance outflows impede economic growth in Saudi Arabia? The role of trade, labour force, human, and physical capital. *Humanities and Social Sciences Communications*, 10(1), 1-9. <https://doi.org/10.1057/s41599-023-01607-z>
- Khalid, W., Akalpler, E., Khan, S., & Shah, N. H. (2021). The relationship between unemployment and economic growth in South Africa: VAR analysis. *Forman Journal of Economic Studies*, 17(1). <https://doi.org/10.32368/FJES.20211701>

- Kulikov, P., Aziukovskyi, O., Vahonova, O., Bondar, O., Akimova, L., & Akimov, O. (2022). Post-war economy of Ukraine: *Innovation and investment development project. Economic Affairs*, 67(5), 943–959. <https://doi.org/10.46852/0424-2513.5.2022.30>
- Lim, W. M., Bansal, S., Kumar, S., Singh, S., & Nangia, P. (2024). Necessity entrepreneurship: A journey from unemployment to self-employment. *Global Business and Organizational Excellence*, 43(6), 41-58. <https://doi.org/10.1002/joe.22256>
- Louail, B., & Benarous, D. (2021). Relationship between economic growth and unemployment rates in the Algerian economy: Application of Okun's law during 1991–2019. *Organizations and Markets in Emerging Economies*, 12(1), 71-85. <https://doi.org/10.15388/omee.2021.12.48>
- Mabrouki, M. (2023). Patent, education, human capital, and economic growth in Scandinavian countries: A dynamic panel CS-ARDL analysis. *Journal of the Knowledge Economy*, 14(3), 3028-3043. <https://doi.org/10.1007/s13132-022-01001-1>
- Maestas, N., Mullen, K. J., & Powell, D. (2023). The effect of population aging on economic growth, the labor force, and productivity. *American Economic Journal: Macroeconomics*, 15(2), 306-332. <https://doi.org/10.1257/mac.20190196>
- Masenya, T. M. (2021). Technopreneurship development: digital strategy for youth self-employment in the digital economy. In *Handbook of research on management and strategies for digital enterprise transformation* (pp. 196-218). Hershey: IGI Global. <https://doi.org/10.4018/978-1-7998-5015-1.ch010>
- Misra, A. K., & Kumari, M. (2024). Modelling the effect of informal and formal jobs on the dynamics of unemployment. *International Journal of Bifurcation and Chaos*, 34(9), 2450116. <https://doi.org/10.1142/S0218127424501165>
- Misra, A. K., Kumari, M., & Sajid, M. (2024). Role of informal sector to combat unemployment in developing economy: A modelling study. *Heliyon*, 10(13). <https://doi.org/10.1016/j.heliyon.2024.e33378>
- Moridian, A., Radulescu, M., Usman, M., Mahdavian, S. M., Hagi, A., & Șerbănescu, L. (2025). Unemployment rate and its relationship with government size, trade, inflation, urbanization, and economic growth in Romania. *Heliyon*, 11(10). <https://doi.org/10.1016/j.heliyon.2024.e41579>
- Mukhtar, A. H., & Nawang, N. I. (2025). Organizational development and corporate law excellence: A perspective of human resource development and behavioural training. *Review of Law and Social Sciences*, 3(1), 15-21. <https://doi.org/10.71261/rlls/3.1.1521>
- Nag, S. (2024). Economic growth and hours worked-long-term evidence from 65 countries. *Available at SSRN 4930134*. <https://dx.doi.org/10.2139/ssrn.4930134>
- Priambodo, A. (2021). The impact of unemployment and poverty on economic growth and the human development index (HDI). *Perwira International Journal of Economics & Business*, 1(1), 29-36. <https://ejournal.unperba.ac.id/index.php/pijeb>
- Sarwar, A., Khan, M. A., Sarwar, Z., & Khan, W. (2021). Financial development, human capital and its impact on economic growth of emerging countries. *Asian Journal of Economics and Banking*, 5(1), 86-100. <https://doi.org/10.1108/AJEB-06-2020-0015>
- Spencer, D. A. (2022). A four-day working week: Its role in a politics of work. *The Political Quarterly*, 93(3), 401-407. <https://doi.org/10.1111/1467-923X.13173>
- State Statistics Service of Ukraine. (n.d.). *Official website*. Available at: <https://www.ukrstat.gov.ua/>

- Sultana, T., Dey, S. R., & Tareque, M. (2022). Exploring the linkage between human capital and economic growth: A look at 141 developing and developed countries. *Economic Systems*, 46(3), 101017. <https://doi.org/10.1016/j.ecosys.2022.101017>
- TheGlobalEconomy. (n.d.). *GDP per capita, PPP - Country rankings*. Available at: https://www.theglobaleconomy.com/rankings/GDP_per_capita_PPP/
- Uddin, I., & Rahman, K. U. (2023). Impact of corruption, unemployment and inflation on economic growth evidence from developing countries. *Quality & Quantity*, 57(3), 2759-2779. <https://doi.org/10.1007/s11135-022-01481-y>
- Villela, R., & Paredes, J. J. (2022). Empirical analysis on public expenditure for education, human capital and economic growth: Evidence from Honduras. *Economies*, 10(10), 241. <https://doi.org/10.3390/economies10100241>
- Widarni, E. L., & Bawono, S. (2021). Human capital, technology, and economic growth: A case study of Indonesia. *The Journal of Asian Finance, Economics and Business*, 8(5), 29-35. <https://doi.org/10.13106/jafeb.2021.vol8.no5.0029>
- Wijaya, A., Kasuma, J., & Darma, D. C. (2021). Labor force and economic growth based on demographic pressures, happiness, and human development: Empirical from Romania. *Journal of Eastern European and Central Asian Research (JEECAR)*, 8(1), 40-50. <https://doi.org/10.15549/jeecar.v8i1.571>
- World Bank. (n.d.). *World Development Indicators*. Available at: <https://data.worldbank.org/>
- Yerrabati, S. (2022). Self-employment and economic growth in developing countries: is more self-employment better? *Journal of Economic Studies*, 49(2), 315-329. <https://doi.org/10.1108/JES-08-2020-0419>
- Zayed, N. M., Edeh, F. O., Darwish, S., Islam, K. M. A., Kryshstal, H., Nitsenko, V., & Stanislavyyk, O. (2022). Human resource skill adjustment in service sector: Predicting dynamic capability in post COVID-19 work environment. *Journal of Risk and Financial Management*, 15(9), 402. <https://doi.org/10.3390/jrfm15090402>
- Zhou, C., Zheng, H., & Wan, S. (2023). Industrial structure, employment structure and economic growth – Evidence from China. *Sustainability*, 15(4), 2890. <https://doi.org/10.3390/su15042890>
- Ziberi, B. F., Rexha, D., Ibraimi, X., & Avdiaj, B. (2022). Empirical analysis of the impact of education on economic growth. *Economies*, 10(4), 89. <https://doi.org/10.3390/economies10040089>

Appendix A

Table A1: Results of the regression analysis of the impact of labour market infrastructure effectiveness on economic growth of EU and EEA countries

Indicators	Coeff.	Std Err	LCL	UCL	t Stat	p-value	H0 (5%)	VIF	Beta
Intercept	274,192.8497	74,389.3248	116,494.5260	431,891.1735	3.6859	0.0020	<i>Rejected</i>		
Unemployment rate	-5,071.3580	4,093.9496	-13,750.1434	3,607.4274	-1.2387	0.2333	<i>Accepted</i>	1.8566	0.3069
Employment rate	-1,597.4713	2,001.6485	-5,840.7765	2,645.8339	-0.7981	0.4365	<i>Accepted</i>	1.5946	0.1833
Hours worked per year	-131.8135	51.7379	-241.4929	-22.1340	-2.5477	0.0215	<i>Rejected</i>	2.0840	0.6688
Self-employment, percent of total employment	1,544.9176	1,542.6894	-1,725.4379	4,815.2731	1.0014	0.3315	<i>Accepted</i>	2.9526	0.3129
Share of informal employment	-59,300.4262	105,876.5616	-283,748.7102	165,147.8577	-0.5601	0.5832	<i>Accepted</i>	1.5986	0.1288

Source: Authors' calculations based on The Global Economy and World Bank World Development Indicators (accessed 21 October 2025).

Table A2: Results of the Regression Analysis of the Impact of Labour Market Infrastructure Effectiveness Indicators on the Economic Growth of the Regions of Ukraine

Indicators	Coeff.	Std Err	LCL	UCL	t Stat	p-value	H0 (5%)	VIF	Beta
Intercept	-663,942.3105	438,313.4865	-1,581,342.9812	253,458.3602	-1.5148	0.1463	<i>Accepted</i>		
Unemployment rate	-6,394.3334	4,122.1679	-15,022.1300	2,233.4631	-1.5512	0.1373	<i>Accepted</i>	1.4862	-0.2130
Employment rate	-837.2510	2,777.3449	-6,650.3006	4,975.7986	-0.3015	0.7663	<i>Accepted</i>	1.6608	-0.0438
Hours worked per year	521.4859	282.5627	-69.9247	1,112.8965	1.8456	0.0806	<i>Accepted</i>	1.5021	0.2548
Self-employment, percent of total employment	59,840.5741	12,366.4076	33,957.3855	85,723.7627	4.8390	0.0001	<i>Rejected</i>	1.5095	0.6696
Number of informally employed population, thousands of people	-191.9067	165.7197	-538.7620	154.9486	-1.1580	0.2612	<i>Accepted</i>	1.2414	-0.1453

Source: Authors' calculations based on State Statistics Service of Ukraine data