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## THE IMPACT OF LABOUR MARKET ON MIGRATION PROCESS IN THE CENTRAL AND EASTERN EUROPE

### ВПЛИВ РИНКУ ПРАЦІ НА МІГРАЦІЙНІ ПРОЦЕСИ В ЦЕНТРАЛЬНІЙ І СХІДНІЙ ЄВРОПІ

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The article presents the results of the study of the main trends of the labor market in Central and Eastern Europe during 2010–2021; it also investigates selected labour market outcomes affecting migration processes in Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Romania, Poland, Slovak Republic, Slovenia, and Hungary. Using econometric modeling, the impact of GDP per capita, annual net earnings per employee, job vacancy rate, unemployment rate on the number of emigrants from these CEE countries was estimated. It is followed by the analysis which controls for dependence of the number of immigrants to CEE countries on labor market outcomes and GDP per capita. The simulation results demonstrate a direct impact of the indicators of net earnings per worker, the level of unemployment and quantity of emigrants from CEE countries. At the same time, there is a direct relationship between job vacancy rate, net earnings and immigration into Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Romania, Poland, Slovak Republic, Slovenia, and Hungary.

**Key words:** labor market, employment rate, unemployment rate, migration, CEE countries.

У статті проаналізовано основні тенденції та стан ринку праці країн Центральної та Східної Європи упродовж 2010–2021 років. З'ясовано, що важливим результатом заходів, вжитих на національному та наднаціональному рівнях стало досягнення високого рівня зайнятості населення, зниження безробіття та збільшення кількості робочих місць у 2019 р. У Чехії, Естонії, Угорщині відбулось скорочення рівня безробіття більше, ніж в три рази; у Латвії, Литві, Польщі, Словаччині – більше, ніж в два рази. Рівень безробіття у Болгарії та Румунії був на досить високому рівні під час вступу до ЄС та в перші роки після приєднання, однак ці країни досягли зменшення безробіття в два рази. У той же час, введення карантинних обмежень негативно вплинули на стан ринку праці, але були збалансовані заходами, запропонованими Європейською Комісією (використання інструменту SURE, схем скороченого робочого часу та короточасної роботи). У дослідженні також проаналізовано тенденції міграційних процесів упродовж 2010–2019 років, з'ясовано, що у Латвії та Польщі спостерігалось скорочення потоків емігрантів, що було пов'язано з поліпшенням ситуації на ринку праці та, в цілому, зі стабілізацією економіки. В інших країнах ЦСЄ, наприклад, Болгарії, Румунії, Словацькій Республіці, Угорщині спостерігалось зростання еміграційних потоків внаслідок високого рівня безробіття та інших соціально-економічних чинників. Виявлено закономірності між станом ринку праці та міграційними процесами в країнах ЦСЄ. За допомогою економетричного моделювання оцінено вплив ВВП на душу населення, річного чистого заробітку одного працівника, коефіцієнту вакантних робочих місць, рівня безробіття на кількість емігрантів з Болгарії, Чеської Республіки, Естонії, Латвії, Литви, Румунії, Польщі, Словацької Республіки, Словенії, Угорщини. В ході дослідження також проаналізовано залежність кількості іммігрантів вказаних країн ЦСЄ від

річного чистого заробітку одного працівника, коефіцієнту вакантних робочих місць, рівня зайнятості та ВВП на душу населення. В процесі дослідження виявлена пряма залежність між показниками чистого заробітку одного працівника, рівнем безробіття та показником кількості емігрантів з країн ЦСЄ. У той же час, доведено прямий зв'язок між показниками чистого заробітку одного працівника, коефіцієнтом вакантних робочих місць та показником іммігрантів до країн ЦСЄ.

**Ключові слова:** ринок праці, рівень зайнятості, рівень безробіття, міграція, країни ЦСЄ.

В статье проанализированы основные тенденции и состояние рынка труда стран Центральной и Восточной Европы на протяжении 2010–2021 годов. Исследованы закономерности между состоянием рынка труда и миграционными процессами в странах. Посредством эконометрического моделирования оценено влияние ВВП на душу населения, годового чистого заработка одного работника, коэффициента вакантных рабочих мест, уровня безработицы на количество эмигрантов из Болгарии, Чешской Республики, Эстонии, Латвии, Литвы, Румынии, Польши, Словацкой Республики, Словении, Венгрии. В процессе исследования выявлена прямая зависимость между показателями чистого заработка одного работника, уровнем безработицы и эмиграционными потоками. В ходе исследования также проанализирована зависимость количества иммигрантов в страны ЦВЕ от факторов рынка труда и ВВП на душу населения. Доказана прямая связь между показателями чистого заработка одного работника, коэффициентом вакантных рабочих мест и количеством иммигрантов в страны ЦВЕ.

**Ключевые слова:** рынок труда, уровень занятости, уровень безработицы, миграция, страны ЦВЕ.

**Introduction.** The countries of Central and Eastern Europe represent a very interesting object of study in terms of migration processes and the labor market, due to the fact these countries have undergone significant changes in socio-cultural and economic terms over the past 20 years. The transition from centralized planning to market economy required a number of reforms, including the liberalization and integration of important markets (capital market, labor market, etc.). While population movements were limited during the socialist period, the labor market of CEE countries has undergone transformational changes under the influence of economic, political, socio-cultural, demographic and other factors later.

Eventually, after the accession of Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Romania, Poland, Slovak Republic, Slovenia and Hungary to the European Union, there is an intensification of participation of these countries in the European migration processes which is characterized by increased emigration, especially its labor component, to Western European countries, mainly to Germany, France, Italy and Great Britain. Migration to North America is observed on a smaller scale. Modern researchers emphasize the importance of migration processes in the European region and referred to the economic and political situation as their major calls.

**Analysis of recent research and publications.** The main issues of the labor market and migration processes in the European countries have been studied by leading researches, such as Borjas J. T. [1], Boswell C. [2], Brandariz J. A. [3], Fidrmuc J. and Huber P. [5], Ghatak S., Mul-

hern A. and Watson J. [6], Grundey D. and Sarvutytė M. [7], Guardia N. D. and Pichelmann K. [8], Hazans M. [9], Kaczmarczyk P. and Okólski M. [10], Kahanec M., Zaiceva and A. Zimmermann K.F. [11; 12]; Molodikova I. [13], and others. Also, the official documents of the European Commission, International Labor Organization, International Organization for Migration provide data on the abovementioned issues.

**Selection of previously unsolved parts of the general problem.** In recent years, there has been an increasing number of researchers interested in the issues of the labor market and migration processes. As the number of migrants and direction of migration flows largely depend on the labor market conditions, it is highly important to investigate these phenomena simultaneously. Among current researches, a rich number of studies on the impact of EU enlargement on migration flows from new member states, analysis of the effects of the migration crisis in 2015, the impact of the pandemic of 2019–21 on unemployment and migration is observed. At the same time, the relationship between the main indicators of the labor market and migration processes in the CEE countries remains insufficiently studied, which makes this study relevant.

**Aim of the article (task statement).** The aim of the study is to analyse the impact of labor market and GDP per capita on immigration and emigration from Central and Eastern Europe: Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Romania, Poland, the Slovak Republic, Slovenia, and Hungary.

**The main research results.** Modern migration processes of European countries actively respond to the policies pursued in the labor mar-

ket and to events taking place in socio-political life. Certain trends took place in the labor market of the CEE countries throughout 2010–2019, which were reflected in the positive dynamics of employment. Migration processes have also changed which is why it is important to investigate what labor market factors have the greatest impact on migration flows.

Considering the dynamics of employment and unemployment in CEE countries, it can be noted that the labor market in these countries showed positive trends during 2010–2019, as at the end of the period the employment rate was 73.2%. The largest increases in the employment rate during this period were observed in Estonia (from 66.8% to 80.2%) and in Lithuania (from 64.3% to 78.2%). As of 2019, the highest rates were identified in the following countries: the Czech Republic (79.7%), Estonia (78.8%), Latvia (77%). Romania showed the lowest employment rate (70.8%), therefore the imbalance between countries is quite moderate compared to other EU countries [4].

Unemployment rates in Central and Eastern Europe during 2010–2019 tended to decrease. The highest unemployment rates were recorded in 2010–2013, especially in the Baltic States – in Latvia (19.3%), Lithuania (17.8%) and Estonia (16.7%). This is due to the cyclical nature of unemployment and economic recovery after the crisis. The number of unemployed gradually decreased over time. As of 2019 the unemployment rate in this group of countries became moderate in Latvia (6.4%), Slovakia (5.6%) and Lithuania (6.4%); low values – in Bulgaria (4.2%), Estonia (4.3%), Hungary (3.3%), Poland (3.2%), Romania (3.7%), Slovenia (4.4%) [4].

Due to stable economic growth, a successful combination of active and passive labor market policies, and the implementation of the EU 2020 Strategy, most CEE countries have seen an increase in labor demand, which has been reflected in an increase in the vacancy rate. Over ten years, this figure increased by 0.2 pp in Bulgaria, by 5.5 pp – Czech Republic, 0.4 pp – Estonia, 2.2 pp – Latvia, 0.8 pp – Lithuania, 0.5 pp – Romania, 0.5 pp – Poland, 0.3 pp – Slovak Republic, 1.6 pp – Slovenia, 1.5 pp – Hungary. The increase in the number of vacancies in the labor market indicates the dynamic development of industry, trade, services and other activities [4].

However, the labor market responded to the pandemic of 2019–2021 by significantly reduction in the vacancy rate. The largest decline (from 0.5 to 1 pp) was recorded in the Czech

Republic, which was 5.5% in 2020, Hungary (2%), Latvia (2.1%), Slovenia (1.7%). Due to the implementation of quarantine restrictions in 2020–21, there was a significant decrease in demand for labor and increase in unemployment. Looking at 2020, the situation on the labor market was as follows: there was a decrease in employment rate in all CEE countries, except Poland (the indicator increased by 0.6%). The largest changes are shown in Bulgaria and Lithuania – their indicators decreased by 1.6% and 1.5% respectively. The average unemployment rate for both women and men aged 20 to 64 in Central and Eastern Europe was 5.45%. Latvia (9.2%) and Lithuania (9.5%) stood out with a high share of unemployed men. The unemployment rate in the Czech Republic in 2020 was 2.2%, which was the lowest rate not only among CEE countries but also in the EU as a whole. The highest unemployment rates among women were again observed in Latvia and Lithuania but at a lower percentage – 7.3% and 7.9% respectively. The lowest unemployment rate among women in both CEE and the EU was recorded in the Czech Republic – 2.9% [4].

Under these circumstances, the European Commission has proposed to use a tool to provide temporary support for workers in order to reduce unemployment risks in emergencies – SURE (support to mitigate unemployment risks in an emergency). In order to protect employees and save their positions, schemes of reduced working hours and short-term work were applied: employees had to work with fewer working hours and lower wages. The measures taken made it possible to keep the employment rate at a relatively high level [14].

It should be noted that the processes of external migration usually actively respond to events taking place in the country and labor market in particular. The largest flows of both emigration and immigration were observed in Poland and Romania. The abovementioned states act as both exporters and importers of labor. The lowest rates are quite differentiated, as the low intensity of emigration processes is noticeable in Lithuania, Latvia and Estonia and immigration processes – in Hungary, Estonia and Slovakia. Concerning the migration balance, the indicator is positive mainly for the entire time period in the following countries – the Czech Republic (since 2013), Estonia (since 2015), Hungary, Slovenia (since 2011) and Slovakia. The indicator is negative in Bulgaria, Lithuania (except 2019), Latvia, Poland (except 2018–2019), Romania. Comparing the intensity of migration flows, the Visegrad

Four countries are becoming less active due to the restrictive migration policies of these countries, experiencing significant impact after the European migration crisis [4].

An important factor influencing migration is the level of income tax, as there is a certain interdependence – one may observe larger flows of emigration in the countries with the highest tax rate in this group, such as Romania (15.2%), Hungary (16.3 %), The Czech Republic (16.5%). At the same time, the level of employment and unemployment directly depends on the periods of growth and decline of the economy, and therefore with the help of GDP per capita it is possible to determine the level of economic activity and quality of life. After analyzing GDP per capita and migration flows, it is worth of noting certain interdependence: countries with higher GDP per capita had a lower intensity of emigration flows in 2019 (Estonia – \$ 23027, Slovenia – \$ 25517, Slovakia – \$ 19156 [4].

The increase in the number of immigrants to the above countries over the last 10 years is due to the propensity of local people for skilled occupations. That is why states need more and more migrant workers to meet the demand for labor. In addition, more and more foreigners declare the family's purpose of relocation, which is facilitated by the short distances and the intensification of repatriation policies in the region. The countries of Central and Eastern Europe implement numerous student exchange programs, which contribute to the growth of educational migration.

In order to conduct an in-depth analysis of the abovementioned processes and phenomena, it is necessary to identify the greatest influence of factors on the both processes of immigration and emigration of Central and Eastern Europe. Labor market indicators and GDP per capita were chosen as exogenous variables as well as the most important economic factors of labor migration. In this case it is appropriate to apply precisely panel data (several objects of observation are included at the same time). Data for the period 2010–2019 includes 100 observations. It is assumed that the number of emigrants from Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Romania, Poland, Slovakia, Slovenia and Hungary is affected by: GDP per capita, annual net earnings of a full-time single worker earning an average wage, vacancy rate and unemployment rate in the labor market. The study also assessed the dependence of the number of immigrants on the first three factors and on the level of employment.

Based on the algorithm of construction and evaluation of the model on panel data and con-

tent features, the regression equation is proposed:

$$Emig_{it} = \alpha + \beta_1 * GDP_{it} + \beta_2 * Earn_{it} + \beta_3 * Vacancy_{it} + \beta_4 * Unemp_{it} + v_{it} \quad (1)$$

$$Immig_{it} = \alpha + \beta_1 * GDP_{it} + \beta_2 * Earn_{it} + \beta_3 * Vacancy_{it} + \beta_4 * Empl_{it} + v_{it} \quad (2)$$

where *Emig* – number of emigrants from the country, person; *Immig* – number of immigrants to the country, person; *GDP* – GDP per capita, USD; *Earn* – annual net earnings of a full-time single worker earning an average wage, PPP; *Vacancy* – vacancy rate, %; *Unemp* – unemployment rate, %; *Empl* – employment rate, percentage;  $\alpha$  – constant; *i* – object number (country),  $i = 1, \dots, 10$ ; *t* – time variable;  $v_{it}$  – standard error.

Statistical estimates of the impact of exogenous variables, which were obtained based on the use of 1LS methods, fixed and random effects for model 1, are presented in table 1:

Further analysis was conducted towards the statistical assessment of the impact of GDP per capita, annual net earnings of a full-time single worker earning an average wage, vacancy rate and employment rate on the number of immigrants to the selected group of countries. Statistical estimates for model 2 are presented in table 2.

Regression models (1-2) were evaluated using OLS methods and panel diagnostics (fixed and random effects). Based on a pairwise comparison of models pooled with RE, pooled with FE and RE with FE using Wald, Breusch-Pagan test, and Hausman tests (calculated Hausman statistics in model (1) is 13.0507, p-value = prob (Xi-square (4) > 13,0507) = 0,01103. The calculated Hausman statistics in model (2) are equal to = 7,062, the p-value = prob (Xi-square (4) > 7,06195) = 0,1326). Therefore, the fixed effects method is the most appropriate one of econometric analysis for further statistical and economic interpretation.

The simulation results indicate a direct relationship between the unemployment rate, annual net earnings of a full-time single worker earning an average wage, and emigration flows. The unemployment rates have the greatest impact on the number of emigrants from Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Romania, Poland, Slovakia, Slovenia, and Hungary. *Ceteris paribus*, if unemployment rises, citizens will be more likely to emigrate than if the country has a stable level of employment. This correlation between workers' incomes and emigration can be explained by administrative, transport and other costs in the process while moving to another country. Therefore, it is important to have a certain level of income to afford migration.



Table 1

## Coefficients and their statistical evaluation (model 1)

Variables	Pooled model	Fixed effects model (FE)	Random effects model (RE)
	Coefficient (t-statistics)	Coefficient (t-statistics)	Coefficient (t-statistics)
Constant	242948 (7,957) ***	-90125,9 (-1,171)	-2191,01 (-0,0469)
Earn	1183,82 (4,928) ***	2288,7 (1,690)*	1039,82 (1,618)
GDP	-9,650 (-6,062) ***	0,909 (0,637)	-0,1037 (-0,073)
Unemp	-9034,31 (-4,708) ***	2825,77 (2,360)**	1531,16 (1,681)*
Vacancy	-9068,99 (-0,977)	411,018 (0,126)	1745,7 (0,565)
R <sup>2</sup>	0,46	0,96	–
F <sub>stat.</sub> (p-value)	19,95 (0,0001)	168,02 (0,0001)	–

\*\*\* – statistical significance by level 0,01; \*\* – statistical significance by level 0,05; \* – statistical significance by level 0,1.

Source: the authors' calculations based on data [4]

Table 2

## Coefficients and their statistical evaluation (model 2)

Model parameters	Pooled model	Fixed effects model (FE)	Random effects model (RE)
	Coefficient (t-statistics)	Coefficient (t-statistics)	Coefficient (t-statistics)
Constant	-80573,4 (-0,952)	-57934,9 (-2,139) **	-39115,7 (-1,185)
Earn	1143,78 (5,002)	2190,09 (2,612) **	1361,7 (2,374) **
GDP	-10,231 (-5,656)	1,031 (1,054)	0,963 (0,996)
Empl	4082,12 (2,242)	-398,75 (-0,698)	7,475 (0,015)
Vacancy	16261,2 (2,067)	5653,85 (2,261) **	7450,61 (3,348) ***
R <sup>2</sup>	0,3	0,97	–
F <sub>stat.</sub> (p-value)	10,39 (0,0001)	228,08 (0,0001)	–

\*\*\* – statistical significance at level 0,01; \*\* – statistical significance at level 0,05.

Source: the authors' calculations based on data [4]

The simulation results represent a direct relationship between migration flows to Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Romania, Poland, Slovakia, Slovenia, and Hungary and the annual net earnings of a full-time single worker earning an average wage and the vacancy rate. This situation reflects attractiveness of these countries for foreign nationals, especially in the context of economic factors of migration, namely the labor market conditions. Notisable that most immigrants

come to these countries from non-EU countries. For instance, during the period 2010–2019, the largest share of immigrants came to Poland from Ukraine; to the Baltic countries – from Russian Federation, Belarus, Ukraine; to Bulgaria – from Russia; to Slovenia – from Bosnia and Herzegovina; to the Czech Republic – from the USA. Moreover, over the years, the issuance of "Blue Cards" has increased in all countries of the selected group, which indicates a growing need for highly-skilled specialists.

**Conclusions.** Thus, the labor market of CEE countries showed a stable positive trend during 2010–2019: the measures taken at the level of the European Union and individual countries had the effect of increasing the number of vacancies, significantly increasing employment and reducing unemployment. The average annual salary of employees increased by 25–85%. During the introduction of quarantine restrictions, the labor market responded by reducing employment in all countries of the selected group (except Poland), declining the number of vacancies and increasing unemployment. It has become possible to keep the situation under control through the implementation of joint measures by the European Commission and governments (SURE programme, part-time and short-term schemes).

The model revealed a direct relationship between the unemployment rate, annual net earn-

ings of a single worker and emigration flows from Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Romania, Poland, Slovakia, Slovenia, and Hungary. At the same time, the unemployment rate is the most significant, and therefore, has the greatest impact on the number of emigrants from these countries. The model results also prove a correlation between the immigration flows to CEE countries, annual net earnings of a full-time single worker earning an average wage and the vacancy rate. The indicator of annual net earnings of a full-time single worker earning an average wage was the most significant, therefore, has the greatest impact on the number of immigrants to the selected group of countries. The obtained data can be used for economic analysis of the impact of the labor market on migration processes in Central and Eastern Europe and hence for decision-making at the state level on labor market policy.

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