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Migration and Labour Market Competitiveness: The Case of EU

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Abstract

The development of the world economy and deepening globalisation lead to intensifying migration processes globally. European Union is the destination country for a significant part of migrants which has a crucial impact on the member-states economies influencing the labour market competitiveness. The goal of the current paper is to estimate the effect of immigration, emigration and migration of asylum seekers on the labour market indicators – unemployment and average annual wage and labour market competitiveness, in selected EU member-states. To achieve the article's primary goal, we use the method of panel data analysis on yearly data from 2003 to 2019. We developed a fixed-effects model for unemployment and a random effects panel data econometric model for wages to estimate the significance of migration processes for labour market indicators. The results show that the immigration of migrants with high qualifications and high skills has a significant positive impact on the labour market of the recipient country leading to a higher competitiveness. In contrast, the increase in the number of asylum applicants has a slight negative impact, hence harming the competitivesness of the country. On the other hand, the rise in emigration negatively impacts the labour market of the donor country as a result of the "brain drain" leading to a lower competitiveness.

Keywords: *immigration, emigration, labour market, competitiveness, unemployment, wages, asylum seekers.*

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1 INTRODUCTION

Migration processes have been a part of human history for centuries. Decades ago, many countries welcomed immigration flows to fill the labour supply shortage, economic gap or for educational purposes, thus enhancing the economic development of the countries. However, the development of the world economy in the 21st century has been accompanied by intensified migration processes, including increasing levels of refugees and asylum seekers. According to ILO (2021), there were 169 million migrant workers in the world in 2019, comprising 62% of the total migrant population and 4.9% of the total labour force worldwide and 24.2% in Northern, Southern and Western Europe. According to the World development indicators, the international migrant stock accounts for more than 243 million as of 2015, against 72 million in 1960. The considerably high levels of migration in the European Union, particularly after EU enlargement in the 2000s, have a significant influence on the demographic composition of the population by age, social and professional structure, impacting the labour market and economic indicators bringing the adjustment of national migration policies to the forefront of the member-states authorities.

Work migration can have both negative and positive impacts on the labour market of the recipient country. To determine whether the external labour migration improves or worsens the labour market conditions, it is necessary to identify whether the country has a supply shortage or a new workforce that creates additional pressure on the market, contributing to increasing unemployment and affecting wages. The controversial nature of the impact of labour migration

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on economic indicators and the labour market in the recipient countries makes it necessary to identify and consider both negative and positive effects when developing the migration policy. Despite some positive effects that labour migration may have on economic growth, the labour market effects are not apparent. Moreover, it can have a severe negative impact by increasing the shadow economy and the number of illegally employed people. Currently, the illegal employment of foreigners is of great concern for the authorities of EU member-states (EMN Synthesis Report, 2017).

Many researchers are exploring the influence of migration processes on labour market indicators. However, there is no comprehensive study identifying and comparing the impact of voluntary migration and migration of asylum seekers on labour market indicators to the best of our knowledge. The current study aims to determine the nature and significance of the impact of voluntary migration and migration of asylum seekers on unemployment and wages in the European Union based on a panel data analysis.

The structure of the paper consists of an introduction, literature review, research methodology, research results and discussion, and conclusions. The introductory part presents the topic's relevance and is followed by the literature review providing comprehensive information on the state-of-the-art research question. The following section represents the methods and methodology used in the paper and the sample for the empirical analysis. The results of the panel data analysis are described in the next section, followed by a discussion indicating the contribution to the existing literature. The last section introduces the conclusions reached as a result of the current study.

2 THEORETICAL BACKGROUND

The enlargement of the European Union in the 2000s brought the migration processes and their possible impact on the labour market to the attention of politicians and scholars (Barrell et al., 2010). Moreover, recent events resulting in a significant wave of inflow of asylum seekers raised the importance of efficient migration policies and their economic impacts even higher (Gavurova & Kubak, 2021; Kallio et al., 2021; Pendakur, 2021; Valenta et al., 2019). Many academic papers study the labour market effects of international work migration (see Johnson, J., & Schulhofer-Wohl, 2019; Lialina, 2019; Theoharides, 2018). The main impact areas discussed in the economic literature are economic growth (Serban et al., 2020; Štefančík & Seresová, 2021; Tolmacheva, 2020), unemployment (Cimpoeru, 2020; Ozekicioglu, 2019), welfare (Cristea et al., 2020; Godin, 2019; Rangazas & Wang, 2019), wages (Gabszewicz, & Zanaj, 2020; Gardner, 2019; Ren et al., 2021) and productivity (Babović, 2020; Cardoso, 2020; Fassio et al., 2019; Manić & Mirkov, 2020).

Labour migration influences both the labour supply (Berulava, 2019; Friberg, 2016; Yu et al., 2021; Sivak et al., 2019) and the labour demand (Devitt, 2018; Tarasyev & Jabbar, 2018; Vorobeva & Dana, 2021) in the recipient country. From the demand side, the inflow of immigrants increases the economy’s gross demand, leading to an increase in capital stock during the long run (Rauhut, 2021; Terzakis & Daskalopoulou, 2021; Galstyan et al., 2021; Ushakov, 2022). Usually, it leads to a rise in output and wages, accompanied by higher inflationary pressures. On the other hand, from the supply side, the inflow of migrants can lead to negative pressure in the labour market. It results in a decrease in wages and weakening inflationary pressures (Dudu & Rojo, 2021; Barbulescu, 2022). Moreover, changes in labour supply can cause behavioural changes in the national markets and policy responses (Horvath et al., 2021; Nae, 2009; Snel et al., 2021; Wrobel, 2021; Zhao & Li, 2021). All in all, the impact

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of work migration on the labour market is ambiguous (Fasani et al., 2020; Liďák & Štefančík, 2022).

Ozekicioglu (2019) studied the impact of migration on economic indicators in 23 selected OECD countries based on the panel data approach. According to their results, migration has a significant negative effect on unemployment. Latif (2015) came to similar results exploring the relationship between work migration and unemployment in Canada. On the other hand, while examining the relationship between migration and the labour market in Turkey, Çelik & Arslan (2018) found a strong positive impact of immigration and emigration on unemployment. Ruist (2013) studied the influence of refugee migration on the labour market, coming to the conclusion that it did not have a significant impact on unemployment in Sweden. The literature review on the relationship between migration flows, and unemployment revealed that there is currently no generally accepted approach to the question under consideration (Begović et al., 2020; Bankston & Zhou, 2021; Caplanova et al., 2021a, b; Ćosić, 2020; Mojsovska, 2021; Stefancik et al., 2021; Vukliš, 2020).

Cardoso (2020) studied the influence of migration on welfare, concluding that the positive or negative impact on welfare depends on the labour market wage response to the scale and source-country composition of migrants in their country. On the other hand, Gabszewicz & Zanaj (2020) found evidence of the negative impact of emigration on welfare in the donor country while having a positive effect on welfare in destination countries in case of wage flexibility. However, other studies (Dustmann et al., 2008; Gavurova et al., 2021; Gawrycka et al., 2020; Kabir, 2021; Sirkeci et al., 2022) argue that the immigration impact on the labour market significantly depends on the education level and skills of native people compared to migrants. Moreover, Piyapromdee (2021) explored the relationship between immigration flows, welfare, and wages in the United States, indicating a positive effect for low-skill workers and negative effects for high-skill workers.

Martinoia (2011) applied the SVAR model to study the labour market effects from immigration to the member-states of the EU from Central and Eastern Europe. The estimation results indicated that the immigration wave leads to an increase in employment accompanied by a salary decrease. Another research done in the United States (Weiske, 2019) using the SVAR model estimated the significance of immigration processes for the country's economy. The author concluded about a negative influence on real wages and a positive influence on investments in the short run. At the same time, the impact on output and consumption was not significant. Exploring the impact of immigration and emigration in host and donor countries, Noja & Son (2016) used panel data covering eight EU member states. The authors revealed that immigration has a long-run negative impact on the labour market, leading to a slight decrease in employment and salaries.

The literature review shows that the impact of migration on labour market indicators, including unemployment, employment and wages, differs depending on the countries and regions.Current research will contribute to the existing literature by exploring the impact of voluntary migration and migration of asylum seekers on the labour market in the European Union.

3 RESEARCH OBJECTIVE, METHODOLOGY AND DATA

The current article aims to estimate the significance and direction of the influence of voluntary migration and migration of asylum seekers on the selected indicators of the labour market. For this purpose, annual panel data on the selected EU member states were used for the period from 2003 to 2019. The panel data included the following countries: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Ireland, Italy, Latvia,

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Lithuania, Luxembourg, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain and Sweden. The countries were selected based on the data availability for the period under review to have balanced panel data. The estimations of the panel data regression models were done using the econometric package EViews 10. The panel data approach is a widespread method for estimating selected indicators' influence on the dependent variable from a regional perspective (see de la Fuente-Mella et al., 2021; Musa et al., 2021; Noja & Son, 2016; Ozekicioglu, 2019).

In the framework of the current study, unemployment (UNEMP) and average annual wage levels (WAGE) were chosen as the labour market indicators. The annual data from 2002 to 2019 was collected from the World Bank on World Development Indicators and the OECD database. All the data has been logged on a natural basis. The first difference against the previous year was calculated to make the time series stationary. The first difference for the year 2003 was calculated by using the data for the years 2002 and 2003; thus, the year 2002 was dropped, and the analysis was done for 17 years (from 2003 to 2019). The data was adjusted to eliminate the outliers to have a normal distribution. The authors also tested the data for stationarity and heteroscedasticity.

The immigration number (IM), the number of asylum applicants (AS) and the emigration number (EM) were included in the model as the independent indicators. For this purpose, we collected the corresponding data from all three variables from the Eurostat database. We applied the methodology described above for processing the selected indicators' data. The last step of the data processing was the calculation of the first differences from the previous period. Tab. 1 shows the descriptive statistics of unemployment, average annual wages, immigration, emigration and asylum seekers.

Tab. 1 – Descriptive statistics of the variables. Source: Author's calculations on the basis of Eurostat, OECD and World Bank databases.

	UNEMP	WAGE	IM	EM	AS
Mean	*-0.2368*	*0.0287*	*0.0436*	*0.035*	*0.0177*
Median	*-0.36*	*0.027*	*0.0361*	*0.0235*	*0.028*
Maximum	*3.25*	*0.079*	*0.6967*	*0.588*	*0.98*
Minimum	*-4.3799*	*-0.0255*	*-0.6781*	*-0.6458*	*-1.1184*
Std. Dev.	*1.2854*	*0.0193*	*0.0206*	*0.1812*	*0.4325*
Skewness	*0.1654*	*-0.0703*	*-0.0532*	*0.0876*	*-0.145*
Kurtosis	*3.4304*	*2.7439*	*4.7157*	*4.6458*	*2.7134*
Jarque-Bera	*4.3829*	*1.27*	*43.9556*	*40.7469*	*2.4721*
Probability	*0.1118*	*0.5299*	*0.00*	*0.00*	*0.2905*
Observations	*357*	*357*	*357*	*357*	*357*

Our research hypothesis is that immigration and migration of asylum seekers have a negative impact on the labour market. In contrast, emigration has a positive impact on the selected EU member-states.

We have developed two panel-data econometric models presented in (1) and (2) equations.

$$Unemp_{it} = C + \alpha IM_{it} + \beta EM_{it} + \gamma AS_{it} + u_i + \varepsilon_{it}\ , \qquad (1)$$

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$$Wage_{it} = C + \alpha IM_{it} + \beta EM_{it} + \gamma AS_{it} + u_i + \varepsilon_{it} \, . \quad (2)$$

Where i = 1, …, N represent the selected EU countries; t = 1, …, T represent the corresponding periods; IM_{it} represents a vector of time-varying explanatory variables for immigration flows across the selected EU member states; EM_{it} represents a vector of time-varying explanatory variables for emigration flows across the selected EU member states; AS_{it} represents a vector of time-varying explanatory variables for the number of asylum applicants across the selected EU member states; $Unemp_{it}$ and $Wage_{it}$ are the dependent variables; ε_{it} is the error term. The panels are balanced with a total number of observations equal to 357. We have considered three possible panel data models: pooled-OLS, Fixed effects and Random effects. The selection of one of these three models depends on the nature of the individual residual u_i.

4 RESULTS AND DISCUSSION

Firstly, we have estimated the model for the total unemployment rate as the dependent variable. Tab. 2 represents the output of estimation results for pooled-OLS model (left column), fixed effects model (middle column) and random effects model (right column). In the unemployment model, the probability values for the migration indicators (IM, EM) are lower than 0.05. In the case of a 5% significance level, and at this level, we have a basis for rejecting the null hypothesis of coefficients being equal to 0. We can consider the immigration and emigration indicators as significant.

On the other hand, the p-value for asylum seekers' inflow is high enough to reject the null hypothesis. Hence, the indicator for the flow of asylum seekers does not have a significant impact on unemployment. The estimation results also show that the regressors can explain 21% of unemployment changes (R-square adj.=0.21). However, the current study aimed to estimate the significance of the selected indicators.

In the case of the application of the fixed effects method, the model of unemployment, the results are similar to the results of the pooled-OLS method, with the flow of asylum seekers being not statistically significant. We also got similar results when applying the random effects method, which is presented in the last column.

On the other hand, considering that the estimation results of Prob (F-statistic) is lower than 0.05 in the case of all three methods applied, we can argue that the data used for the model estimation provides sufficient evidence that model (1) fits the data better than would a model without the selected independent indicators.

Tab. 2 – Estimation results for unemployment. Source: Author's calculations on the basis of Eurostat, OECD and World Bank databases.

	Pooled OLS		Fixed effects (FEM)		Random effects (REM)	
Regressor	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
IM	*-2.496*	*0.00*	*-1.507*	*0.00*	*-1.758*	*0.00*
EM	*1.776*	*0.00*	*1.447*	*0.00*	*1.531*	*0.00*
AS	*0.145*	*0.312*	*0.086*	*0.523*	*0.101*	*0.443*
C	*-0.193*	*0.002*	*-0.223*	*0.00*	*-0.216*	*0.05*
R-square	*0.2128*		*0.4261*		*0.1516*	
R-square adj.	*0.2061*		*0.4255*		*0.1444*	

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F-statistic	*31.8008*	*14.8758*	*21.0324*
Prob (F-statistic)	*0.00*	*0.00*	*0.00*

The next step includes the choice of the estimation method that fits the model (1) the best. For this purpose, we have applied the LM test (Lagrange multiplier) that compares the appropriateness of the pooled-OLS and Random Effects estimation methods for model (1). The results of the test are presented in Tab. 3 with p-values in parentheses. LM test indicates that there are no random effects for cross-section, while the pooled-OLS method is not appropriate regarding the period. Hence, we have the basis for rejecting the null hypothesis of the model having no random effects (period).

Tab. 3 – Lagrange multiplier (LM) test for unemployment. Source: Author's calculations on the basis of Eurostat, OECD and World Bank databases.

Null (no rand. effect) Alternative	Cross-section One-sided	Period One-sided	Both
Breusch-Pagan	*0.1604*	*214.3424*	*214.5028*
	(0.6888)	*(0.00)*	*(0.00)*
Honda	*0.4005*	*14.6404*	*10.6355*
	(0.3444)	*(0.00)*	*(0.00)*
King-Wu	*0.4005*	*14.6404*	*11.1793*
	(0.3444)	*(0.00)*	*(0.00)*

Then we proceed to apply the Hausman Test (Correlated Random Effects) to compare the appropriateness of random effects and fixed effects methods regarding period. Tab. 4 shows the results of the Hausman test with the values of chi-square and p-value. The output results show that we have enough evidence to consider period fixed effects as the most appropriate model for the model (1). As a result, the fixed effects model was chosen to estimate the coefficients in model (1) to reflect the impact of the selected indicators on unemployment.

Tab. 4 – Hausman test for unemployment. Source: Author's calculations on the basis of Eurostat, OECD and World Bank databases.

Null (rand. effect)	Chi-Sq. Statistic	Degrees of freedom	Prob.
Period random	*23.6243*	3	0.00

Tab. 5 shows the results of estimating the coefficients in the second model. It is evident that the results are quite different from the model (1). In the case of the pooled-OLS model, the p-values of IM and AS are lower than 0.05 providing robust evidence to reject the null hypothesis (coefficients equal to zero) at a 5% significance level. Hence both IM and AS are considered significant in the wage model. On the other hand, the p-value for emigration is high enough to reject the null hypothesis and assume the variable is not significant for the average annual wage. The adjusted R-square equals 0.0528, indicating that the regressors can explain only 5.28% of the change in the average wage. However, as already mentioned above, we aim to test the significance of the independent variables.
In the case of the fixed effects model for (2), the results are similar to the results of the pooled-

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OLS method, with IM and AS being significant at the 5% level. The p-value for EM is 0.0809; hence emigration does not have a significant influence on the dependent variable at the 5% significance level. Still, we have the basis for rejecting the null hypothesis at a 10% level. We got similar results to the fixed effects model when applying the random-effects method. For all three models estimated for equation (2), the probability of F-statistic is less than 0.05, indicating that the data used for the model estimation provides sufficient evidence that model (2) fits the data better than a model without IM EM and AS independent variables.

Tab. 5 – Estimation results for wages. Source: Author's calculations on the basis of Eurostat, OECD and World Bank databases.

	Pooled OLS		Fixed effects (FEM)		Random effects (REM)	
Regressor	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
IM	*0.0174*	*0.0005*	*0.01003*	*0.0385*	*0.01168*	*0.0145*
EM	*-0.0075*	*0.1748*	*-0.00905*	*0.0809*	*-0.00875*	*0.0891*
AS	*-0.0087*	*0.0002*	*-0.00506*	*0.0331*	*-0.00591*	*0.0109*
C	*0.0283*	*0.00*	*0.02862*	*0.00*	*0.02856*	*0.00*
R-square	*0.0608*		*0.2665*		*0.0344*	
R-square adj.	*0.0528*		*0.2251*		*0.0262*	
F-statistic	*7.6172*		*6.4434*		*4.1945*	
Prob (F-statistic)	*0.00006*		*0.00*		*0.0062*	

To choose the most appropriate model in the case of equation (2), we followed the same steps described for equation (1). Firstly, the Lagrange multiplier (LM) test was applied for panel data to compare the appropriateness of pooled-OLS and Random Effects method. Tab. 6 represents the output results with p-values in parentheses. LM test indicates that we have strong evidence to reject the null hypothesis of no random effects at the 5% significance level.

Tab. 6 – Lagrange multiplier (LM) test for wages. Source: Author's calculations on the basis of Eurostat, OECD and World Bank databases.

Null (no rand. effect) Alternative	Cross-section One-sided	Period One-sided	Both
Breusch-Pagan	*119.6774*	*103.1256*	*222.8030*
	(0.00)	*(0.00)*	*(0.00)*
Honda	*10.9397*	*10.15508*	*14.91627*
	(0.00)	*(0.00)*	*(0.00)*
King-Wu	*10.93972*	*10.15508*	*14.8623*
	(0.00)	*(0.00)*	*(0.00)*

Then we proceed to apply the Correlated Random Effects test (Hausman Test) to decide on the appropriateness of the random effects or fixed effects methods. Tab. 7 shows the results of the Hausman test where Chi-square and p-value outputs can be found. The output results

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of the Hausman test show that we do not have a basis for rejecting the null hypothesis at the 5% significance level; rather, we accept the null hypothesis and consider the period random-effects model as the most appropriate for estimating the coefficients in the model (2). As a result of the empirical testing, we found that the random-effects model is the best for estimating the influence of selected economic indicators on wages.

Tab. 7 – Hausman test for wages. Source: Author's calculations on the basis of Eurostat, OECD and World Bank databases.

Null (rand. effect)	Chi-Sq. Statistic	Degrees of freedom	Prob.
Period random	*6.5198*	3	0.0889

Equations (3) and (4) show the estimated fixed-effects model for unemployment and the random-effects model for wages, respectively.

$$Unemp_{it} = C - 1.507IM_{it} + 1.447EM_{it} + 0.086AS_{it} - 0.223, \quad (3)$$

$$Wage_{it} = C + 0.01168IM_{it} - 0.00875EM_{it} - 0.00591AS_{it} + 0.02856. \quad (4)$$

Equation (3) indicates that the coefficient of IM has a negative sign meaning that a rise in the immigration rate by 1% can cause a 1.5% decline in unemployment. On the other hand, the estimated coefficient for emigration is equal to 1.447, indicating a 1.447% increase in unemployment in the case of a 1% rise in emigration. Thus, we can say that according to the estimation results of model (1), migration processes have an overall positive impact on unemployment in the selected EU member-states.

The estimation results of model (2) show that the coefficient of immigration has a positive sign indicating that a 1% increase in immigration will lead to a rise in the average annual wage by 0.012%. It is interesting that while general immigration flows have a slightly positive impact on wages, immigration of asylum seekers has a negative impact. An increase in the number of asylum applicants by 1% will cause a 0.0059% decrease in the average annual wage. As was already mentioned above, emigration is statistically significant only at a 10% significance level. The results show that a 1% raise in emigration leads to a decrease in wages by 0.00875%.

To sum up, the results show that AS is not a significant variable for unemployment but has a statistically significant and slight negative impact on the average annual wage in the selected EU countries. On the other hand, an increase in general immigration has an overall positive impact both on unemployment and wage levels. Here we can conclude that such results can be conditioned by the level of skills of asylum seekers and labour migrants. Generally, asylum seekers either do not have education or have low qualifications and are considered low-skilled workers. Accepting jobs at lower prices than natives, they contribute to a salary decrease in the field.

On the other hand, high-skilled migrant workers probably will demand higher wages. In this regard, our results are in line with the study done by Dustmann et al. (2008), who argued that immigration impact on the labour market significantly depends on the education level and skills of native people compared to migrants. However, we conclude about the positive effect on high-skill workers and a negative impact on low-skill native workers regarding wages, while the results suggested by Piyapromdee (2021) are the opposite.

And finally, emigration is a statistically significant factor for both unemployment and average annual wages, and results indicate to negative impact in both models. Our results in this regard are in contradiction with the results suggested by Çelik & Arslan (2018), who found a strong

positive impact of emigration on unemployment. However, in regard to immigration, the results align but are in contradiction with the results of the study done by Noja & Son (2016).

5 CONCLUSION

The current paper studied the impact of voluntary migration and migration of asylum seekers on the labour market indicators. The results show that immigration and emigration have a significant influence on unemployment and annual average wage. At the same time, the number of asylum applicants is statistically significant only for the wage. Moreover, the estimated coefficients indicate an overall positive impact of immigration on the labour market indicators, while emigration and asylum seekers have a significant negative impact.

Based on the results, our primary assumption is that the education and skills of migrants have a central role in the impact of migration processes on the labour market. Hence, the immigration of migrants with high qualifications and skills will have a significant positive impact on the labour market of the recipient country. On the other hand, the emigration of educated and high-skill citizens will lead to a "brain drain" and have a negative impact on the economy of the donor country. Moreover, the immigration of low-skilled migrants, like most asylum seekers, has a slight negative impact on the labour market.

The research limitation is the relatively high development level of the selected states. Many of them mostly have issues with immigration rather than emigration. There is a need for further research to confirm the study results and conclusions of the current paper considering other regions with some emerging and transition market countries, including countries from Eastern Europe for which a high number of emigration is typical. Moreover, future research can include a broader list of labour market indicators to further test different sides of the impact of migration processes.

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