A STUDY ON MACROECONOMIC VARIABLES' EFFECT ON UNEMPLOYMENT ACROSS EUROPE

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Abstract
Europeans' choice to emigrate is complexly related to motivation and includes both economic and social factors such as family impact, gender inequalities, and differences in income. By comprehending the factors that motivate people to leave their home countries and the strategies they use to do so it is possible to achieve important insights into the phenomenon of emigration within the diverse landscape of European society. Due to the economic crisis of 2008, there was a significant increase in unemployment rates in several European countries, with notable impacts in some countries like Romania, Greece, Portugal, Spain, and Italy. The emigration that resulted had a detrimental effect on the economy, reduced job opportunities, and lowered the overall standard of living. Within the context of the countries in which emigration has played a significant role in the economy, the intent of this empirical research is to investigate the effects of specific macroeconomic factors on economic imbalance and unemployment. The unemployment rate, gross domestic product (GDP), minimum income, and external incomes in several European countries are some of the factors that are currently being considered. In this study, we investigate the impact of these variables on unemployment in a sample of twenty-four European countries between the years 2002 and 2020. Our methodology is based on panel data, more specifically, the Generalized Method of Moments (GMM). The results showed that during the period under analysis, the minimum wage and remittance inflows had a negative impact on unemployment in the studied European countries, while the emigration rate had a positive impact.

Keywords
Unemployment, minimum wage, emigration, income, Europe.

JEL Classification
J60, O15, E24

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Introduction

The emigration phenomenon, especially after the accession to the European Union (EU), has received considerable attention in Central and Eastern European (CEE) countries. In this period, emigration was generally regarded as advantageous for the emigrant but also for the destination country. The CEE region has experienced comparable patterns of emigration, although there is a prevailing perception of negativity associated with it. The migration pattern in question gives rise to concerns about its potential long-term effects on the structure of the labour market. The primary cause of this is the phenomenon known as “brain drain”, which happens when very talented and skilled people leave a region.

Prior studies have frequently considered the post-EU emigration surge to be a "natural experiment" to examine its impact on unemployment. The economic backdrop for each country's EU accession varied, and demand growth and periods of economic expansion had an impact on unemployment rates. For example, economic growth significantly contributed to lower unemployment rates in 2004 and 2007, when several countries joined the EU. On the flip side, emigration prompted by push and pull factors was a factor in Croatia's 2013 accession, which happened while the world was still reeling from the global economic crisis.

This paper seeks to empirically examine the effects of emigration on economic indicators, including economic growth (GDP), minimum wage, remittance inflow, and the unemployment rate. The study is focused on a sample of European Union (EU) countries that undergo the emigration phenomenon. The distinctiveness of this research consists in the sample chosen, which includes both New Member States (NMS) and older EU member states facing emigration. The states that have experienced a net outflow of immigrants, with emigration exceeding immigration from 2002 to 2020, are catalogued as emigrant countries.

The impact of unemployment on emigration in the European Union countries

The aim of our study is to contribute to the limited research literature by empirically examining the effects of migration outflows, with emphasis on emigration and the unemployment rate, across a sample of EU emigrant countries.

Emigration from European nations, such as the one from East European nations, has been a significant concern ever since they acceded to the EU. Beforehand, emigration was considered beneficial for both the emigrant and the host country. Nowadays, it is generally regarded as negative, with potential long-term impacts on the structure of the labour market. After its accession to the EU in 2013, Croatia has been experiencing comparable patterns, since emigration is viewed as disadvantageously due to the "brain drain", the departure of young, talented individuals.

Previous studies from the research literature have often regarded the increase in emigration that occurs after joining the EU as a natural experiment to view how it affects unemployment. The economic conditions of the years before accession, for example, the expansion and rising demand in 2004 and 2007, made it challenging to separate the effect of emigration from other factors that influenced unemployment. The admission of Croatia in 2013 coincided with the world economic crisis, that led to emigration as a result of various push and pull factors.

In the sample, we included 27 European countries, based on which we intend to shed light on the labor-market dynamics impacted by migration outflows by analyzing the relationship between emigration and unemployment rates. Policymakers, who attempt to address the issues raised by emigration and promote sustainable economic development in the impacted nations, will find this analysis to be particularly important.

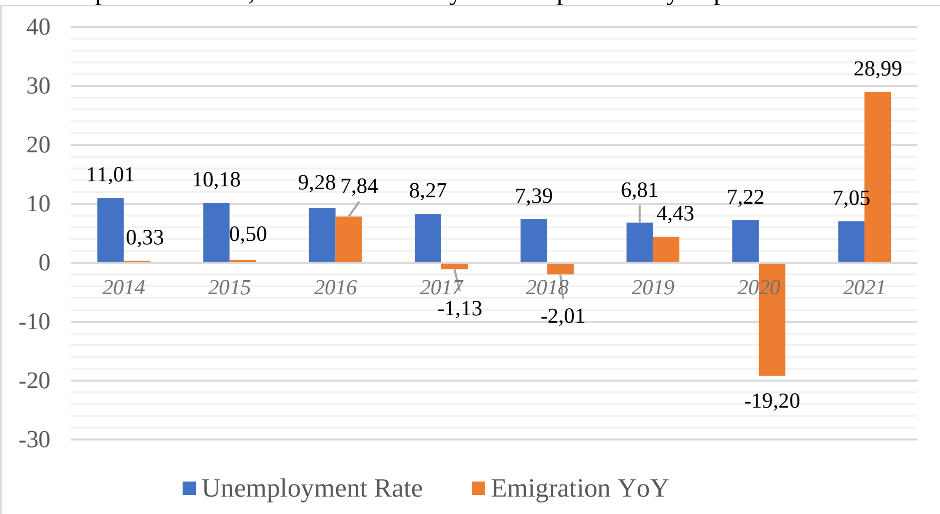

Figure no. 1: Unemployment rate and emigration (year on year) of active population in the EU-27 countries

Source: Own compilation based on Eurostat and OECD data.

In this study, we aim to investigate the relationship between emigration and unemployment, particularly as it relates to long-term consequences. The theory that is under investigation is consistent with a widely held assertion from the research literature, mainly known as the "Emigration helps mitigate unemployment" hypothesis (Asch, 1994).

According to Eurostat data as shown in our research, 64% of all emigrants are in the 15–64 age range. The age range of 25 to 29 accounts for around 18% of this cohort. A nation's labour force may face difficulties as a result of the age distribution of immigrants, which indicates a large loss of skilled labour. Figure no.1 shows a summary of the average unemployment rate and emigration rate (YoY) for the EU-27 member states from 2014 to 2021. The data is presented as a percentage of the entire working age population.

The COVID-19 pandemic determined an important halt to emigration from European countries. This was influenced by certain factors, for example: travel restrictions, border closures, the decision of some individuals to remain in their home countries rather than risk to contract the virus. This tendency was specifically noticeable as EU citizens chose to stay in their current locations rather than relocate.

This temporary halt of emigration determined the stabilization of population numbers within individual EU countries. But despite the challenges caused by the pandemic, the unemployment rate in 2020 underwent just a slight increase across the EU. In spite of this, this increase was not substantial enough to significantly have an impact on the population dynamics of member states.

In our research, we examine more than the immediate effects of the financial crisis and the COVID-19 pandemic on unemployment and emigration in European countries. Even though these have their important role, we highlight the importance of studying some additional factors such as GDP, remittance inflow, and minimum wage. We attempt to clarify the interconnections between these factors and determine if their correlations have substantial influence on unemployment and emigration trends in European countries.

We broaden our scope to include GDP, so as to discern how economic growth or contraction impacts unemployment and emigration rates. We proceed with the analysis of the remittance inflow in order to determine the impact that monetary transfers from overseas have on these phenomena, which have the potential to either alleviate or exacerbate the pressures associated with unemployment and emigration rates. In addition, we investigate the role that minimum wage policies play in shaping the dynamics of the labour market and decisions regarding migration. Furthermore, we investigate whether or not higher or lower minimum wages correlate with changes in the rates of unemployment and emigration.

In our research, we intend to demonstrate that these factors are connected to one another, and that the correlations between them have a significant impact on the patterns of unemployment and emigration that are observed in European countries. We have high hopes that by elucidating the relationships we could be able to offer valuable insights to policymakers and stakeholders who are looking for ways to address challenges in the labor market and migration dynamics in the region.

Does economic growth affect the unemployment rate in Europe?

The more recent years have seen an increase in both empirical and political attention being paid to the problem of unemployment. As a result of the impact of understanding why those indicators (unemployment and GDP growth) have any significant impact on the decision of the citizens of the European Union to emigrate, the issue of unemployment rate has gained both political and empirical attention.

A negative relationship between GDP growth and unemployment rate has been widely corroborated by economists, as stated by Carl Okun, who is credited with establishing the concept of unemployment rate and economic growth (Okun, 1970).

Since its inception, Okun's law (Okun, 1962) has been a widely used instrument for the purpose of conducting research and forecasting macroeconomic conditions. There has been a significant amount of research carried out on it in a variety of different domains, including its capacity for forecasting, its ability to predict over time, and its application in several different countries. Generally speaking, there is a correlation between changes in the unemployment rate and increases in the growth of the GDP. More recent insights into this relationship have come from (Knotek, 2007; Balakrishnan, Das and Kannan, 2010; Meyer and Tasci, 2012), and other scholars. In the field of macroeconomics, (Ball, Leigh and Loungani, 2017) state that Okun's law is still strong and steady even though conclusions vary between nations and historical periods.

Our research utilizes data from the World Bank and Eurostat covering the EU-28 members, with Iceland and Norway. The research investigates the variations in unemployment rates and ratios from one year to the next in order to identify any subtle trends that may be present. Instead of focusing on coefficients that are specific to a particular country, our study estimates the average parameters for the entire sample. This methodology ensures a comprehensive investigation of the relationships between the growth of the GDP and unemployment rates across a range of age categories, thereby providing important insights that can significantly contribute to the formulation of policies and the conduct of additional research endeavors.

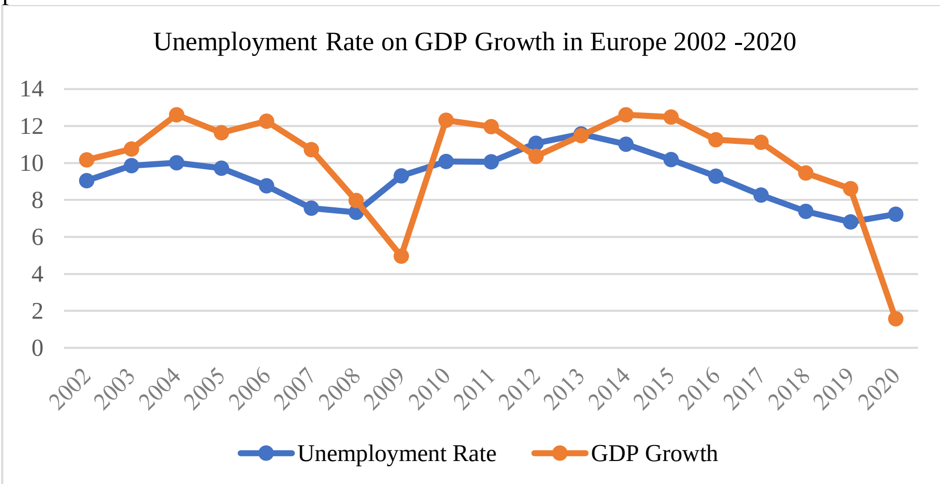

Figure no. 2: Unemployment rate on GDP growth

Source: Own compilation based on Eurostat and World Bank data.

In our research, we discovered that Okun's Law on the inverse relation between the growth of GDP and the unemployment rate, could have a major effect on migration patterns. Decisions about migration are influenced by this relationship in several of ways, such as the following:

1. Migration in search of employment opportunities - people frequently relocate to other countries/regions that experience rapid GDP growth due to their belief that these places can provide greater employment opportunities. It may be also possible for people to decide to move away from regions with high rates of unemployment so as to pursue better opportunities in other regions.

2. Policy implications - when they establish economic policies, policymakers should also take into consideration Okun's Law and migration. For example, the initiatives designed to increase GDP growth to lower unemployment rates could attract unintentionally migrants looking for work. When it is about to putting economic initiatives into action, these dynamic underlines the importance for politicians to take into consideration the different migration trends that are occurring.

For all intents and purposes, applying Okun's Law to the analysis of data may help us gain a better understanding of the ways in which fluctuations in GDP growth and unemployment rates influence migration patterns. It will be possible for policymakers in the not too distant future to understand these processes to successfully negotiate the complexities of immigration and labor markets.

1. Review of the scientific literature

This section focuses on empirical studies that investigate the dynamics of unemployment, economic growth, and migration, both on a global scale and within specific contexts such as the impact of the financial crisis that occurred in 2007. A comprehensive review of the specialized literature in the fields of migration and unemployment served as the basis for the compilation of the list of papers that were analyzed. This research was pulled from reliable resources such as Google Scholar and Web of Science.

Škuflić and Vučković (2018) elucidate the effects of emigration and the impact of unemployment rates in European Union countries, utilizing Eurostat data to calculate the number of emigrants leaving their home country between 2004 and 2015. Particularly, they examine the unemployment rate in correlation with the number of active emigrants in the European Union during the same period. By employing autoregressive econometric models, they assess the relationship between emigration and unemployment; the dependent variable being the unemployment rate and the independent variables being GDP and the labour force. Based on their findings, there is a correlation between higher unemployment rates and increased emigration occurrences.

Researchers from Germany, Spain, and the United Kingdom have come to different conclusions. For example, (Winter-Ebmer and Zimmermann, 1999; Dustmann et al., 2003; D'Amuri, Ottaviano and Peri, 2010) have all presented their findings. Some of the findings of their studies indicate that immigration does not have significant effects on employment rates within their respective countries. This suggests that contextual factors could have a role in determining the outcomes.

Boubtane, Coulibaly and Rault (2013) present their insights into the relationship between immigration, unemployment, and economic growth in OECD countries. Contrary to common perceptions, their panel Granger causality analysis spanning 1980–2005 indicated that immigration did not determine unemployment in any of the studied countries. This challenges conventional wisdom and underlines the complexity of the immigration-employment nexus.

Latif (2015) contributes to this matter and employes a panel cointegration approach with provincial-level data from Canada. The findings suggest that in the short run, immigration has a positive effect on unemployment. Due to the fact that it will decrease over time, this will eventually become statistically insignificant over a longer period of time. It is therefore essential to take into consideration the temporal dimension when conducting an analysis of the impact that immigration has on the outcomes of the labour market.

By presenting evidence that has been compiled from several countries, including 15 countries from the European Union, the United States of America, Australia, and New Zealand, (Jean and Jiménez, 2011) broaden the scope of the investigation even further. After conducting an analysis of data spanning from 1984 to 2003, they found that immigration did not have a significant impact on unemployment over the long run. On the other hand, they observe some minor adverse effects in the short run. It is interesting to note that they discover that countries with more stringent employment protection legislation and more stringent product market regulations experience more persistent short-run effects. This suggests that institutional factors play a role in shaping the immediate impact of immigration on unemployment.

Damette and Fromentin (2013) conduct a more in-depth investigation into the relationship between earnings, unemployment, and migration in countries that are members of the OECD. Based on a panel Vector Error Correction model, they are able to address endogeneity concerns that are associated with these variables. The results of their investigation show that the effects are slightly different in each of the regions. Immigration appears to reduce unemployment in countries located on the continent of Europe in the short term, while simultaneously increasing unemployment in countries located in the Anglo-Saxon region. Based on this regional disparity, it is shown the significance of contextual factors in influencing the effects of immigration on the labour market.

Other researchers (Verick, 2009; Choudhry, Marelli and Signorelli, 2012) have conducted research that investigates the impact that previous financial crises had on unemployment. Their studies highlighted the significant and long-lasting effects that these crises had on youth unemployment.

Migration has been the subject of research that has investigated its effects on unemployment. Theoretical and empirical studies have revealed that the outcomes of migration are mixed, based on factors like the flexibility of the labour market and the degree of task specialization (Ottaviano and Peri, 2008; Boubtane, Coulibaly and Rault, 2013).

Table no. 1. Further studies on literature review

No.	Author(s)	Analysed Period	Countries	Empirical Methods
1	(Okeke, 2021)	2009–2019	Nigeria	Two-stage least square methods (2SLS)
2	(Iorio and Triacca, 2022)	2003–2019	France and Germany	The Vector Autoregressive Model (VECM)
3	(Pal et al., 2022)	1991–2020	High–Middle–Low-Income Countries	The income inequality econometric model
4	(Bunduchi et al., 2019)	1990–2017	Romania	Panel data
5	(Cismaș, Curea-Pitorac and Vădăsan, 2020)	1996–2017	CEE Countries	(OLS) econometric model
6	(Siregar, 2020)	2001–2015	Indonesia	Aggregate provincial panel data
7	(Škuflić and Vučković, 2018)	2004–2015	Romania, Bulgaria, Poland, Greece, Croatia, Latvia, Estonia, Lithuania, Portugal	Panel data analysis (fixed-effects model)

Source: Own compilation from the review of literature.

Table no. 2. Results from the studies

No.	Journal(s) Description	Results
1	Impact of International Remittances on Unemployment in Nigeria	The study indicates that international remittances have a negative effect on the unemployment rate, and also that there is unidirectional causality between remittance and unemployment in the absence of feedback, implying that the Nigerian government should develop programmes to encourage Nigerian citizens to invest their remittance income in businesses.
2	A comparison between VAR processes jointly modelling GDP and Unemployment rate in France and Germany	The dynamic link between GDP and the unemployment rate is analogous in both countries, but this does not imply identical products or labour markets.
3	The impact of remittance inflows on economic growth, unemployment and income inequality: An international evidence	Remittance inflow stimulates economic growth in high, middle, and low-income countries, reduces unemployment only in low and middle-income countries, and remittance inflow often reduces inequality in all countries.
4	Macroeconomic determinants of remittances: evidence from Romania	The results show that a 1% increase in the differential wage in the destination countries causes a 16.88% to 18.89% increase in remittance inflows.
5	The impact of remittances on the receiving country: some evidence from Romania in European context	Remittance inflows are more stable throughout the business cycle but do not invigorate economic growth for Romania.
6	Impacts of minimum wages on employment and unemployment in Indonesia	Minimum wage increases are also expected to reduce unemployment as labour participation falls. After it was divided by gender, the findings show that female workers between the ages of 15 and 24 suffer the greatest loss because of the minimum wage increase.
7	The effect of emigration on unemployment rates: the case of EU emigrant countries	Emigration determines a rise of unemployment rate in the emigrant countries and proves that together with the expected positive impact of lower unemployment, it could possibly exhibit an adverse influence on emigrant countries' labour markets.

Source: Own compilation from the review of literature.

2. Research methodology

For our study we employed the panel data methodology, the Generalized Method of Moments (GMM), in order to investigate the way in which the selected macroeconomic factors influenced the unemployment in a sample of twenty-four European countries for the period 2002–2020.

$$UNE=c_0+c_1*EMI+c_2*REM+c_3*WAGE+c_4*GDP+\varepsilon_t \quad (1)$$

where:

UNE – Unemployment Rate
EMI – Numbers of Emigrants
REM – Remittance Inflow
WAGE – Minimum Wage
GDP – Gross Domestic Product

Table no. 3. Variable(s) description

Variable(s)	Description
UNE	Unemployment expressed as a year-on-year percentage increase
EMI	Number of Emigrants expressed as a year-on-year percentage increase
REM	Remittance inflow is the money sent from emigrants to their own country expressed as a year-on-year percentage increase
WAGE	Minimum wage expressed as a year-on-year percentage increase
GDP	Gross Domestic Product expressed as a year-on year percentage increase

3. Results and discussions

Table no. 4. Empirical Results

Variable	(1)	(2)	(3)	(4)	(5)
C	0.020716*	0.003394	0.005797	0.005986	0.058789*
	(0.013292)	(0.0091)	(0.00916)	(0.009996)	(0.008098)
EMI	0.005283	0.001551			
	(0.00408)	(0.007203)			
REM	0.002354		-0.01175		
	(0.003318)		(0.008854)		
WAGE	-0.00488			-0.00358	
	(0.006676)			(0.006519)	
GDP	-0.01779*				-0.02768*
	(0.003998)				(0.001802)

Source: Own processing.

The initial descriptive analysis based on average values shows us a potential positive correlation between unemployment and emigration rates. This intuitive insight, on the other hand, needs additional econometric scrutiny that makes use of panel data. Control variables, such as GDP per capita and policies on the labour market, will be incorporated into subsequent analyses to gain an improved understanding of the complex relationship between emigration and unemployment. Our ambition is to provide a comprehensive understanding of the factors that influence the dynamics of the labor market in emigrant countries based on rigorous econometric methods.

Based on our research, the minimum wage has a negative impact but is insignificant from an econometric point of view, but GDP has a significant impact on unemployment. A low GDP has a negative impact on a country, the more a country's GDP decreases, the inflation rate will increase, the labour market is reduced and slows down the economic development processes of a country. Emigration and remittance inflows have a positive impact as long as remittance inflows have a negative impact on unemployment.

Hazans and Philips (2010) show that the effect of high emigration leads to a decrease in the unemployment of the respective country, but also in monetary gains from foreign income. Theoretically (Dustmann, Frattini and Rosso, 2015), they analyzed that the effects of the emigration of skilled workers from Poland had a fairly significant growth rate, and unskilled workers had a decrease in the minimum wage. According to research done by (Amuedo-Dorantes and Pozo, 2011), the remittance inflow sent by emigrants aims to establish the income of family members, and unemployment is reduced and the country's consumption is improved.

The number of emigrants in any European country represents a reduction in the country's production flow, but the main issue is that the emigration of skilled workers has a negative impact on all countries worldwide, whereas unskilled workers in their home country can always find work because the minimum wage in every country remains constant.

Studies based on empirical evidence provide a variety of insights about the complex relationship between remittances and minimum wage. Some researchers, such as (Canales, 2007), believe that remittances can compensate for lost incomes as a result of migration, and others, such as (Funkhouser, 1992), make the observation that there is a reduction in labour force participation in conjunction with a promotion of self-employment. In addition, (Rodriguez and Tiongson, 2001) observed disruptive effects on labour force participation. Gender disparities in labour market responses to remittances are presented by nuanced analyses, such as the one that was carried out by (Amuedo-Dorantes et al., 2006). This highlights the importance of implementing policy interventions that are specifically targeted.

The discussion regarding the relationship between emigration and unemployment rates continues to be a focal point, particularly on the effects that it has in the short term. It is noteworthy that the recent global economic crisis has exacerbated the unemployment rate for youth, which has prompted a reevaluation of previous financial crises and the effects they had on the dynamics of the labour market, in particular for young workers.

There is a vast body of specialized literature in the field of migration, and various studies have been conducted to address the interrelated debates about the reasons for emigration. One of the most prominent causes from the research literature is represented by the high unemployment rates within a country. All of these are significant macroeconomic imbalances determining individuals to look for opportunities in regions with a higher standard of living than their home land.

Conclusions

In conclusion, it is important to acknowledge the fact that the interpretation of the effects of emigration is subject to certain limitations. The issue of the relationship between unemployment and emigration is one of the most significant challenges that our model addresses. This is accomplished through the use of the GMM panel data. In addition, there are quite a few obstacles that must be overcome to acquire trustworthy information regarding emigrants, particularly in European nations where a sizeable number of emigrants are still not available for identification. Our sample of countries that are members of the European Union is used in this study, and we make use of the EUROSTAT dataset on the flow of emigration from those countries. For this dataset to serve as a proxy for emigrants, we made use of mirror statistics techniques.

As a consequence of the economic crisis that started in 2007, the countries of northern Europe experienced less severe effects than their counterparts in southern Europe, which endured prolonged economic instability characterized by increasing unemployment rates and decreased living standards. In comparison, the countries of southern Europe endured both of these things.

To address the socio-economic challenges that have arisen as a result of the crisis, citizens of the EU have put forward a variety of own responses. The adoption of frugal consumption practices, participation in training programs that guaranteed employment, and, in some extreme cases, participation in street protests to address economic woes were all strategies that were included in these actions.

Emigration from any of the member states of the European Union causes a disruption in the flow of production within the country. The migration of skilled individuals poses a certain particularly negative impact, in contrast to the fact that unskilled laborers are more easily replaceable. It is important to note that workers with low levels of education may experience less of an impact from economic imbalances. The reason for this is that the standards for the minimum wage typically do not change regardless of the fluctuations that occur in the economy.

Within the European Union, Spain and Greece were the countries with the highest unemployment rates, with 16% and 20.6%, respectively. On the other hand, Romania maintained a relatively low unemployment rate of 2.4%, which was lower than the average throughout the EU.

By March 2018, the countries of Eastern Europe reported a total of 3.5 million unemployed young people, while their Western European counterparts reported a total of 2.44 million unemployed young people. Greece (42%), Spain (37%), and Italy (31.7%) are among the countries that are experiencing the highest rates of youth unemployment. While Greece has the highest rate of youth unemployment, in addition to this, the rates of emigration in these countries are currently experiencing a twofold increase.

Our findings continue to be relevant in understanding the relationship between the unemployment rate, economic growth, and minimum wage, and the data could offer some detailed insights into the educational backgrounds or skill levels of emigrants. These findings also encourage additional research avenues to be pursued regarding the effects of emigration, particularly in two key areas. On one hand, there is the possibility to conduct sector-specific analyses, because labour migration has an effect not only on overall wages and unemployment rates, but also on the dynamics of specific sectors. On the other hand, if emigration trends continue, it is imperative that a critical examination of long-term impacts be conducted. This is because these trends have the potential to create significant changes in demographic and economic structures. Therefore, to address the possibility of a mismatch between skills, it would be necessary to reform educational policies and incentivizing labour supply.

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