

## Sustainability of EU Labour Markets During the Coronavirus Crisis

### Zrównoważoność rynków pracy UE podczas kryzysu związanego z koronawirusem

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#### Abstract

The world's labour markets were significantly affected by the coronavirus spread and lockdowns and deaths caused by it. Policy-makers tried to mitigate the consequences of the COVID-19 pandemic on the labour market by imposing different measures and aid packages. Having in mind all activities for combating the COVID-19 pandemic's effect on the labour market in 2020 and 2021, the question arose how resilient are labour markets to the effects of the COVID-19 pandemic compared to the year before the pandemic? Therefore, this study attempts to answer this question by creating a composite index of ten labour market indicators using the MOORA ranking method. The research sample is made up of 27 European Union (EU) countries. In the first step, countries' composite indexes were compared on a year-to-year basis (2019-2020, 2019-2021 and 2020-2021) and no significant discrepancies were observed. In the second step, differences in geographical clusters of countries were captured while comparing their composite indexes for 2020 and 2021. The study results indicate that aid packages restricted the COVID-19 pandemic's effects on the EU labour markets and strengthened their sustainability. The downturn in EU labour market indicators was retained thus making divergence between geographical clusters inherited from the previous periods. The research results indicate the importance of joint EU policies in crisis periods for encouraging the sustainability of the EU labour markets and the need to make a balance among EU labour markets under normal conditions.

**Key words:** sustainability, labour market, EU members, coronavirus, MOORA method

**Jel Classification Codes:** E24, J21, J4

**Słowa kluczowe:** zrównoważoność, rynek pracy, państwa UE, koronawirus, metoda MOORA

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## Introduction

Numerous economic parameters are affected by the coronavirus (COVID-19) pandemic and various measures were taken by countries to combat the epidemic. In doing so, many of these measures have hit the labour market directly or indirectly. Isolation measures have closed not only the borders between the countries but also the entire sectors of the economy such as hotels, retail facilities, offices, etc. Numerous effects have occurred on determinants of the labour market – labour force, employment, unemployment, mode of work (teleworking) and working hours, labour productivity, net earnings, youth and female employment, business communication and business relations, as labour market and business dynamism are interconnected (Milanović et al., 2020). Many companies were forced to suspend operations, lay off workers or shorten working hours, which directly affected the reduction of labour in many sectors. This particularly affected accommodation facilities, service activities, hourly-paid workers and young people. So, the policy responses must have been focused on stimulating labour demand in many sectors. In such conditions, investments in new labour programmes, the adaptation of existing skills through training and retraining programs, and support for young people and people who are less paid and whose occupations are particularly affected in the context of the coronavirus crisis and are the key importance in mitigating the existing crisis conditions. Therefore, public policymakers are forced to use certain measures to influence both supply and demand in the labour market.

Despite several policy measures to retain jobs within the European Union (EU), the labour market in the Eurozone has been hit hard by the pandemic. There was a significant decline in employment and the average number of working hours. As a result, the labour force fell by about 5 million in the first half of 2020 (Anderton et al., 2021). A large number of job losses is comparable to the conditions of the 2008/9 recession (Wilson et al., 2020). Job retention schemes have played and continue to play a key role in many countries in mitigating the consequences of the pandemic labour market. It is a policy to support the labour market at the EU level, which is aimed at keeping jobs through shortening working hours and temporary layoffs (Mayhew & Anand, 2020). All countries globally are facing economic challenges and the need to respond to the impact of the coronavirus crisis on the labour market.

Changes in the labour market are key to reducing gross domestic product at the macro level and the income of many families globally (Lemieux et al., 2020). The governments have tried to support these incomes with aid packages in order to maintain demand at a certain level and enable the normal life of people in crisis conditions caused by the virus. Without targeted state support in the form of financial and other forms of assistance (for example subsidized loans and tax waivers) to certain sectors of the economy, which are especially vulnerable - retail and hospitality, it is unlikely that there will be a recovery of the labour market and favourable trends in employment and unemployment rate.

This paper aims to develop a composite index based on the labour market indicators in order to test the differences on a year-to-year basis by comparing indices of the EU countries in 2019, 2020 and 2021. In this way, the sustainability of the EU labour markets will be assessed and the difference between the two periods of analysis captured. What makes this analysis state-of-the-art is the development of a composite index using the MOORA method for the purpose of the research. The authors tend to give the answer to the research question: Are the EU countries' labour markets resilient to the COVID-19 pandemic outbreak? Additionally, the disparities between geographical clusters of the EU countries were analysed using the created index. The paper is structured as follows: After the introduction, in the first part of the paper, a literature review concerning existing research results on the labour market features is presented. In the second part, data and methodology are shown. The third section reveals the study results which is followed by their discussion. Finally, concluding remarks are pointed out.

### 1. Literature review

Coronavirus first led to a global crisis in human health, which then spilt over into the economy (Lee et al., 2020, p. 11). The pandemic has caused a deeper labour market crisis than the 2009 global financial crisis due to isolation measures. The deepest consequences were felt by middle-income economies, while certain sectors (sectors that require face-to-face communication), especially the service sector and work of youth, specifically females, were more negatively affected during 2020. The COVID-19 pandemic has negatively affected several indicators of the functioning of the labour market. Unlike previous crises, the pandemic has led to a greater increase in inactivity than unemployment (Verick et al., 2022, p. 125). Lee et al. (2020, p. 15) highlight that the female workforce is particularly affected by this crisis because a higher percentage of women than the percentage of men work in the sectors most affected by the coronavirus. Women represent more than 70% of employees in health and social work institutions. This means that these women are most of the workers on the *front line* who face direct virus risks. Within the closed sectors – sectors of the economy most affected (such as restaurants and accommodation facilities), the proportion of females in the EU28 is 56%, which is even higher in Poland and Germany (Fana et al., 2020b).

First of all, many sectors – especially retail, tourism and transport – have been forced to reduce their workforce or reduce their working hours in order to save their businesses from collapse. Many businesses were compelled to lay off large numbers of people, who then found it difficult to find a job in the same sector during a pandemic (Mayhew & Anand, 2020). Losses of jobs and employment caused by the pandemic can lead to a long-term decline in the overall employment-population ratio (Wachter, 2020, p. 549). Measures aimed at combating the pandemic caused a decline in both supply and demand for goods and services, already in the second quarter of 2020. On the supply side, there were disruptions in global supply chains, but there was some recovery in the last quarter of 2020 and the first quarter of 2021. On the demand side, the consumption of many goods and services has been significantly reduced - especially restaurants, recreational facilities, retail facilities, etc. The demand shock was further exacerbated by job and revenue losses, and a high level of uncertainty, which further hampered spending and investment decisions (Verick et al., 2022). These shocks caused direct changes in the labour market and the labour force.

Measures of social distancing have limited geographical mobility both within and between countries, affecting workers whose jobs require travel and migration. Many countries have implemented the measure of abolishing work visas, which has deepened the crisis in the global labour market, especially bearing in mind that international labour migration is a very important segment of the global economy. In addition, it is estimated that tens of millions of migrants were 'stuck' abroad without a job during the pandemic (Barker et al., 2020).

Namely, the pandemic brought shocks to the labour market and the global job crisis. At the global level (observing Europe and Central Asia, Americas, Africa, Arab States, Asia and the Pacific), in the first quarter of 2020, it was estimated a decline of 5.4% in working hours (including inactive people, unemployment, temporary suspension, shorter working hours), and in the second quarter of 2020, there was a decline of 14% which is equal to 400 million full-time jobs. The largest decrease in the first quarter was in upper-middle-income countries (9.3%), while in the second quarter, the largest decline was recorded lower-middle-income countries (16.1%) (Lee et al., 2020).

In 2020, there was a significant increase in unemployment rates within OECD countries. In the UK, the initial increase was more modest than in some other countries. The unemployment rate in Germany also grew relatively slowly, in contrast to the United States, where unemployment rose to over 30 million in just over a month. In France, the number of unemployed increased at the fastest rate ever (Mayhew & Anand, 2020). Young people (aged 18–29) are particularly affected by the COVID-19 crisis. Unemployment is 13.6% of the youth workforce. This crisis affects young people in several ways: limitations in the education of young people, their training and learning at work (face-to-face communication is limited), special difficulties for young people looking for work, loss of income with deteriorating quality of youth employment (Lee et al., 2020).

Demena, Floridi and Wagner (2022) investigated the short-term impact of the COVID-19 pandemic on the labour markets, on the example of developed and developing countries. They came to the conclusion that no significant effects on the labour market can be seen when it comes to formal employment. On the other hand, Costa Dias et al. (2020) concluded that the COVID-19 pandemic did not lead to a slowdown in economic activity in these countries, but a radical decline in activity in the short term. In many sectors, there was a sharp drop in labour demand, while in other sectors supply was reduced. Fana et al. (2020a) concluded that Europe, after Asia, was most affected by the pandemic in 2020.

The EU labour market has been hit by lockdown due to the coronavirus pandemic – closed workplaces, retail, borders, as well as deteriorating human health and pandemic measures. There was a stronger decline in employment and working hours than these parameters in the economic recession of 2008 (the sharpest decrease was achieved in the second quarter of 2020 – 5.2 million fewer employees than at the end of 2019, which is a decline of 3.2%), while unemployment grew somewhat more slowly due to the application of the job retention schemes. A negative aggregate demand shock is considered to be responsible for about 1/4 of the reduction in total working hours. During this pandemic, compensation per employee at the Eurozone level also dropped significantly. In addition, in the first half of 2020, record low employment growth was observed in the EU area. It is interesting that at the EU level, labour productivity per employee decreased significantly during the pandemic, while hourly labour productivity increased, albeit slightly. In the first half of 2020, there was a sharp decline in labour productivity per employee, while hourly labour productivity increased by 2.6% annually, in the second quarter of 2020. This discrepancy arose due to the intensive use of retention schemes by Member States (Anderton et al., 2021).

The policies of different countries varied from country to country, but all had an impact on the labour market and certain categories of workers. Governments that have used wage subsidies more intensively than other forms of income support have managed to reduce labour market volatility. In addition, the pandemic has exacerbated gender inequality in the labour market (Weber et al., 2020; Soares & Berg, 2021). To avoid large redundancies and a sharp rise in the number of unemployed, many EU countries have introduced policies with the same goal – support for the labour market, through leave schemes, subsidized work, part-time work or other forms of support for employers. These countries include France, Germany, the Netherlands, Portugal, Sweden, and Spain (Fujita et al., 2020).

Within the countries of the EU, five types of sectors can be distinguished given the impact of pandemic measures on the workforce and sustainability of labour market (Fana et al., 2020a): 1) *essential and fully active sectors – for example food production, utilities and health (most of the workforce continued to work normally)*; 2) *active but via telework – it includes education, public administration, finance/insurance and telecommunications (work from home – teleworking)*; 3) *mostly essential and partly active, not teleworkable – retail and manufacturing of chemicals, paper and manufacturers of other products that are important in epidemic conditions (active even in conditions of strict measures)*; 4) *mostly non-essential and partly active, not teleworkable – activities that do not require direct interaction such as the majority of manufacturing not previously mentioned, computer repair activities and construction (normal functioning under strict conditions)*; 5) *closed – hotels, restaurants, accommodation, estate/travel agencies, leisure and recreation facilities*.

The consequences of social distancing measures in the EU due to the COVID-19 pandemic are mostly felt by vulnerable labour groups – women, older employees, foreigners, the less educated, those who work longer (people about to retire) and employees in micro-sized jobs, especially since the highly educated have conditions for working from home. It has been determined that around 45 million jobs in the EU-27 labour market, which is 23% of the total number of employees in the EU-27, face a very high risk of COVID-19 disruption (Pouliakas & Branka, 2020). Teleworking played an important role in the initial period of the pandemic in many sectors, especially for highly educated workers, and contributed to the sustainability of the labour market. Therefore, it can be said that the pandemic has had a positive impact on the digital transformation of the EU economy – teleworking supports the intensive application of digital technologies (Anderton et al., 2021).

The pandemic has further deepened the problem of youth unemployment in the EU countries, which existed even before the coronavirus crisis and was an important determinant of the sustainability of the labour market. Greece, Spain and Italy had the highest youth unemployment rates before the crisis within the EU, and the Czech Republic, the Netherlands, Poland and Slovenia achieved the lowest. However, in the countries with the lowest youth unemployment rate before the crisis, it doubled during the crisis due to measures against the pandemic. The most vulnerable countries in this regard are the Czech Republic – the unemployment rate at the end of 2020 rose 2.19 times above the level at the end of 2019, and Estonia – youth unemployment rose compared to the previous year by a factor of 2.5, followed by Lithuania, Latvia and Ireland. In 2020, youth unemployment rose the least in Hungary, Italy and Belgium (Lambovska et al., 2021).

Some research shows that the biggest negative consequences on the labour market institutions and the strongest negative impact on unemployment in the conditions of coronavirus were suffered by countries whose labour markets were the most vulnerable before the pandemic (high unemployment, temporary employment contracts). Namely, it includes Spain, Italy and the UK, which are also the countries that have felt the greatest negative consequences for human health, bearing in mind that they were the first to be affected by the virus in Europe, after the occurrence, with the highest number of deaths (Fana et al., 2020b).

## 2. Data and research methodology

Determining the impact of the coronavirus pandemic on the sustainability of the labour market was done by creating a composite index and comparing the values of composite indices in the years before and during the pandemic. The creation of composite indices for quantification of labour market performance was performed by a two-step procedure, wherein in the first step, the weighting coefficients of criteria were determined using the Entropy method, while in the second step the aggregation of criteria was performed using the MOORA method.

### 2.1. Data

Data from the Eurostat database were used to calculate composite labour market performance indices. Ten indicators were selected that reflect the characteristics of the country's labour market.

A comparative analysis of the descriptive statistics (Table 2) of the criteria in 2019, 2020 and 2021 indicates that there was an increase in unemployment in 2020 (the average value in 2019 is 6.1519), but with a decrease in variability between countries (smaller standard deviation in 2020), while in 2021 there was a decrease of the unemployment rate but it was still above the level of unemployment rate in 2019 (the average value in 2021 is 6.6370) with further reduction in variability between countries. On the other hand, the average annual salary in 2021 increased compared to 2019 and 2020, while the disparity between countries also increased (the standard deviation increased in 2021 compared to 2020 and 2019). The average percentage of people in the labour force has decreased in 2020 but decreased in 2021, with increasing variability between countries in 2020 but with reduced variability between countries in 2021. In 2020, a reduction in average long-term unemployment is noticeable (probably the unemployed died because they did not have access to health care), while in 2021 an increase in average long-term unemployment is observed (probably due to the measures to suppress the coronavirus pandemic, such as the lockdown). In 2020, there was a decrease in average real labour productivity, with a significant increase in disparities between countries, while in 2021 average real labour productivity increased above the levels

before the pandemic, but with a further increase in disparities between countries. The percentage of people working part-time has decreased slightly, while the percentage of the NEET population has increased in 2020 compared to 2019, but decreased in 2021. Finally, the percentage of recent job leavers and jobless households increased in 2020 compared to 2019 but decreased in 2021.

Table 1. Definition of criteria, source: authors' presentation

Criteria label	Criteria name	Definition
C1	Unemployment	Percentage of population in the labour force (from 15 to 74 years)
C2	Annual net earnings	Total money earned in a span of 12 months after specific subtractions are done from your gross income (a single person without children earning 100% of the average earning)
C3	Persons in the labour force	The ratio between the number of active persons aged from 15 to 64 (occupied labour force and the unemployed) and the corresponding total population
C4	Long-term unemployment	Percentage of unemployed people who have been unemployed for 12 months or more
C5	Real labour productivity	Real output per unit of labour input (measured by the total number of hours worked)
C6	Persons outside the labour force	Persons aged from 15 to 74 years who are neither employed nor unemployed (i.e. they are neither working nor seeking work) during the reference period
C7	Employed persons working part-time	Percentage of people in employment aged from 15 to 64 years (whether employees or self-employed) who usually work less than 30 hours per week in their main job
C8	NEET	Percentage of young people aged from 15 to 29 neither in employment nor in education and training
C9	Recent job leavers	Percentage of unemployed people who quit or otherwise voluntarily left their previous job and immediately began looking for new employment
C10	Jobless households	Share of persons aged 18-59 who are living in households where no one works

Table 2. Descriptive statistics, source: authors' calculation

	2019	2020	2021	2019	2020	2021
C1	2.00	2.60	2.80	17.90	17.60	14.80
C2	6093.02	6612.77	6952.14	42650.78	44374.32	45786.60
C3	63.30	63.50	64.50	82.90	82.50	83.70
C4	0.60	0.60	0.80	11.30	10.50	9.20
C5	95.94	88.38	95.31	120.56	120.51	137.34
C6	26.60	26.70	26.20	44.70	44.80	44.10
C7	1.90	1.80	1.50	50.20	50.80	38.70
C8	5.70	5.70	5.50	22.30	23.50	23.10
C9	.40	.40	.40	6.30	5.60	5.50
C10	3.80	4.10	4.30	13.60	13.50	13.10
	Mean			Std. Deviation		
	2019	2020	2021	2019	2020	2021
C1	6.15	6.96	6.64	3.36	3.27	2.89
C2	20845.38	21237.83	22055.47	11296.01	11521.74	11798.64
C3	74.27	73.85	74.86	4.71	5.05	4.74
C4	2.37	2.28	2.49	2.21	1.99	1.85
C5	105.50	101.82	107.19	5.79	8.31	10.96
C6	34.62	35.15	34.36	4.66	4.99	4.81
C7	14.51	14.06	13.15	11.04	10.73	9.21
C8	11.59	12.70	11.99	4.18	4.21	4.20
C9	2.40	2.46	2.19	1.31	1.23	1.22
C10	7.94	8.41	8.18	2.21	2.44	2.40

## 2.2. Entropy method

The entropy method enables the measurement of the intensity of the relative contrast of criteria. Determining the weights of criteria is based on quantifying the uncertainty of information within a data set. The mutual contrast of individual values of indicators is the basis for determining the set of weighting coefficients (Stanković et al., 2021).

Determining the weighting coefficients of the indicator is done in three steps.

Step 1: Normalization of individual values of indicator  $x_{ij}$  using the relation:

$$r_{ij} = \frac{x_{ij}}{\sum_{i=1}^n x_{ij}} \quad (1)$$

Step 2: Determining the entropy value  $e_j$  based on the relation:

$$e_j = -k \sum_{i=1}^n r_{ij} \ln r_{ij}, \quad j = 1, 2, \dots, m \quad (2)$$

where  $k = \frac{1}{\ln n}$  is a constant whose goal is to reduce the value of  $e_j$  to the interval  $[0, 1]$ .

Step 3: Determining the degree of divergence  $d_j$  using the relation:

$$d_j = 1 - e_j, \quad j = 1, 2, \dots, m \quad (3)$$

where  $d_j$  is a measure of the contrast intensity of the indicator  $C_j$ . The greater discrepancy between the initial values of a certain indicator leads to a higher value of the contrast intensity, based on which, it is concluded that the importance of that indicator for the defined multi-dimensional problem is higher. On the other hand, balanced values of a certain indicator indicate less importance of that indicator for a given multidimensional problem.

Step 4: Determination of weight coefficients of indicators by additive normalization using the relation:

$$w_j = \frac{d_j}{\sum_{j=1}^m d_j} \quad (4)$$

Since the weights of the indicators are derived directly from the data of the observation units, it can be concluded that the entropy method provides objective weights that eliminate the problems that the involvement of stakeholders can bring.

Based on the above algorithm, it can be confirmed that the entropy value of each criterion is inversely related to its dispersion (variation) between observation units, and therefore, more weight is given to criteria with larger variations per observation unit, and conversely, less weight is given to criteria with smaller variations. In other words, the greater the variation of an indicator, the greater the value of its entropy and the greater the amount of information it provides. If a particular criterion does not vary by observation, it does not discriminate and does not provide any information on the importance of the criterion. Consequently, its entropy takes a maximum value of one and, accordingly, its degree of importance becomes zero. That is, if all observation units have approximately the same results in relation to a given criterion, then such criterion will be considered irrelevant in the evaluation process.

The main advantages of entropy in the construction of composite indicators are as follows (Karagiannis & Karagiannis, 2020): first, it results in a set of common weight coefficients for all observation units which allows complete comparison and ranking; and secondly, the entropy algorithm is not too demanding and this technique is easy to implement. Compared to the equal weighting scheme, which assigns the same weighting factor to all indicators, the entropy-based weighting scheme provides greater discriminatory power.

### 2.3. MOORA method

MOORA method (Multi-Objective Optimization Method by Ratio Analysis) is a method of multi-criteria analysis based on the process of simultaneous optimization of two or more criteria, which are often in conflict with each other. The method algorithm consists of the following steps (Brauers & Zavadskas, 2006):

Step 1: Forming a decision matrix  $X_s = [x_{ij}]$ , where  $n$  is the number of criteria,  $m$  is the number of alternatives,  $x_{ij}$  is the value of the  $i^{\text{th}}$  alternative realized by the  $j^{\text{th}}$  criterion.

Step 2: Normalize the decision matrix. Normalization in MOORA methods is performed as follows:

$$x_{ij}^N = \frac{x_{ij}}{\sqrt{\sum_{i=1}^m x_{ij}^2}} \quad (5)$$

Step 3: Optimize the multicriteria problem. It is done by adding the normalized criteria values of the revenue criteria and subtracting the normalized criteria values of the expenditure criteria. Then the optimization problem can be set as:

$$y_i = \sum_{j=1}^g x_{ij}^N - \sum_{j=g+1}^{n-g} x_{ij}^N \quad (6)$$

where  $g$  is the number of revenue type criteria, and  $n$  is the number of expenditure type criteria.

However, it is often necessary to include information on the relative importance of the criteria in the optimization process. Then the normalized criterion values are multiplied by the corresponding criterion weight coefficients and the following optimization relation is obtained:

$$y_i = \sum_{j=1}^g w_j \cdot x_{ij}^N - \sum_{j=g+1}^{n-g} w_j \cdot x_{ij}^N \quad (7)$$

Step 4: Depending on the weighted values of the revenue and expenditure criteria, the value of  $y_i$  can be positive or negative. Determination of preference is done based on ranking alternatives by  $y_i$  value where the best alternative has the highest  $y_i$  value, while the worst alternative has the lowest  $y_i$  value.

### 3. Results and discussion

Based on the applied methodology, sets of values of composite indices for 2019, 2020 and 2021 were determined. The results are given in Figure 1.

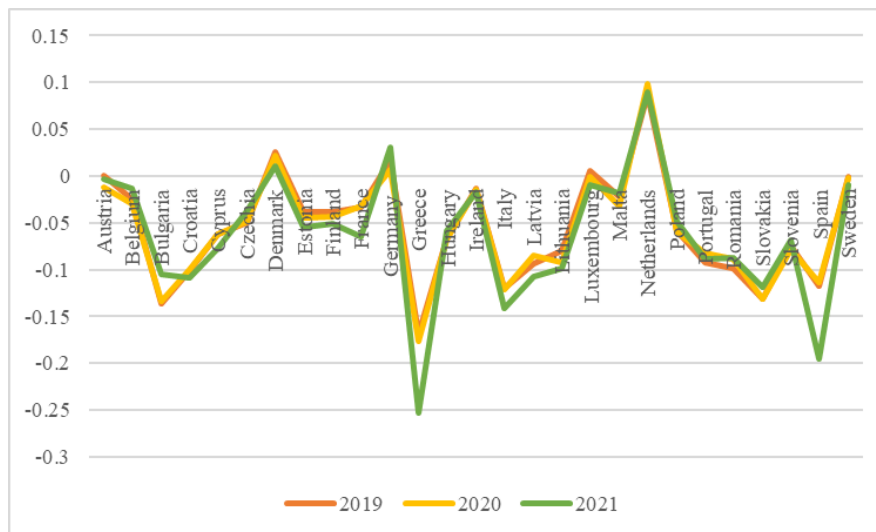


Figure 1. Values of composite indices in 2019, 2020 and 2021, source: authors' presentation

Overall, at the level of the EU, there is no statistically significant difference between the performance of the labour market before and during coronavirus pandemics. However, if separate geographical regions within the EU are observed for 2020 and 2021, as the years faced with the coronavirus pandemic, differences can be noted. Following geographical clusters were analysed (Figure 2):

- Northern Europe: Sweden, Finland, Denmark;
- Western Europe: Belgium, Netherland, Luxemburg, France, Germany, Austria, Ireland;
- Central and Eastern Europe (CEE): Hungary, Poland, Czech Republic, Slovakia, Slovenia, Lithuania, Latvia, Estonia, Bulgaria, Romania, Croatia;
- Southern Europe: Greece, Italy, Spain, Portugal, Cyprus, Malta.

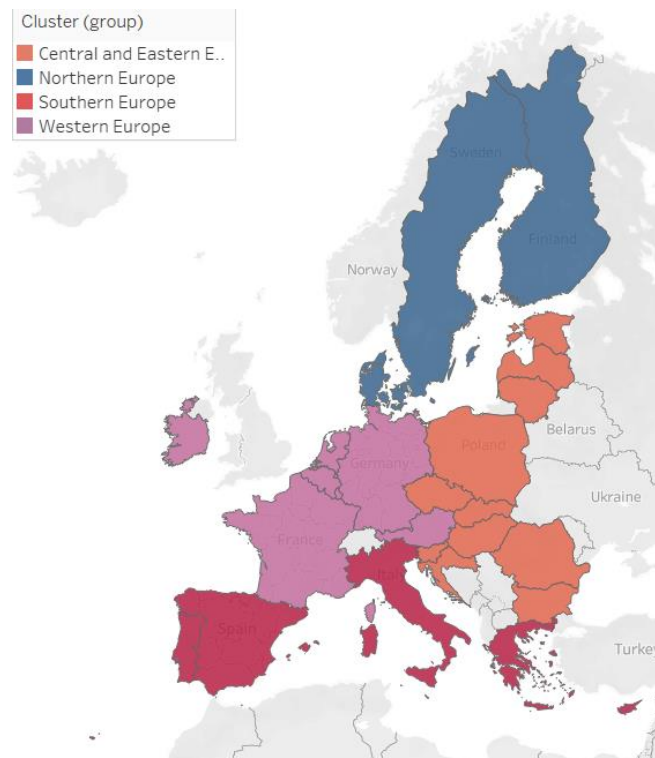


Figure 2. Geographical clusters, source: authors' presentation

In 2020, significant differences in labour markets between Western Europe and Southern Europe, Western Europe and CEE, and CEE and Southern Europe were noticed. No difference between Western Europe and Northern Europe was recorded (Table 3).

Table 3. Differences between clusters of EU countries in 2020, source: authors' calculation

2020		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig.
WE → SE	Equal variances assumed	3.608	.084	2.750	11	.019
	Equal variances not assumed			2.647	8.050	.029
WE → CEE	Equal variances assumed	.916	.353	-2.238	16	.040
	Equal variances not assumed			-2.014	8.982	.075
CEE → SE	Equal variances assumed	15.671	.001	2.168	15	.047
	Equal variances not assumed			1.701	5.806	.141
WE → NE	Equal variances assumed	.237	.639	-1.119	8	.295
	Equal variances not assumed			-1.248	4.990	.267

Note: WE – Western Europe, SE – Southern Europe, NE – Northern Europe, CEE – Central and Eastern Europe

In 2021, significant differences in labour markets between Western Europe and Southern Europe, Western Europe and CEE also existed. However, in 2021 there were no significant differences between CEE and Southern Europe (Table 4). Bearing in mind that the average score of the labour market composite indices of the countries of CEE in 2020 was statistically significantly higher than the average score of the labour market composite indices of the countries of Southern Europe, as well as that in 2021 there was a decrease in the average values of the aforementioned average scores, it can be concluded that in 2021, there was a deterioration in the labour market of the countries of CEE. Regarding Western Europe and Northern Europe, no difference was recorded.

Table 4. Differences between clusters of EU countries in 2021, source: authors' calculation

2021		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig.
WE → SE	Equal variances assumed	2.798	.123	3.484	11	.005
	Equal variances not assumed			3.332	7.562	.011
WE → CEE	Equal variances assumed	.630	.439	4.643	16	.000
	Equal variances not assumed			4.150	8.788	.003
CEE → SE	Equal variances assumed	10.149	.006	1.736	15	.103
	Equal variances not assumed			1.338	5.616	.232
WE → NE	Equal variances assumed	.283	.609	-.601	8	.565
	Equal variances not assumed			-.716	5.952	.501

Note: WE – Western Europe, SE – Southern Europe, NE – Northern Europe, CEE – Central and Eastern Europe

It is perceived that the COVID-19 pandemic had disruptive effects not only on the global economy but also on the labour market. Unemployment was retained at the level of the Global Financial Crisis, but the decrease in total working hours was sharp (Ando et al., 2022). According to Barbier-Gauchard et al. (2021) countries' labour market policies differed from each other during the crisis in choosing to lay off employees (i.e., extensive margin adjustment) or to decrease their daily engagement in work (i.e., intensive margin adjustment). While the COVID-19 labour market crisis, the downturn in employment in the EU was mostly mitigated by job retention schemes (JRS), while the crisis manifested its effects in the total worked hours where decreases on sectoral levels were notable (i.e., transport and tourism). Therefore, the study tried to quantify the impact that the COVID-19 pandemic had on the EU countries' labour markets, but from the point of view of multiple indicators to assess the level of labour market resilience before and during the COVID-19 pandemic. The calculation of one comprehensive index merged various labour market indicators such as unemployment, long-term unemployment, recent job leavers, persons in the labour force, employed persons working part-time, real labour productivity per person, annual net earnings, people aged 18-59 living in jobless households, persons outside the labour force, young people neither in employment nor in education and training (NEET) using the MOORA ranking method. The results indicate that the EU countries did not change their position when it comes to this multidimensional indicator, meaning that the year-to-year index of labour market performances stayed stable in the volatile circumstances. Moreover, the results point out that all EU countries were hit by the pandemic and that negative shocks in previously mentioned indicators did not result in significant differences when it comes to their individual ranking, while differences between countries were more than obvious. EU countries' scores of unemployment rates were not drastically increased due to JRSs and one other phenomenon – a decrease in labour market participation rates (Sazmaz et al., 2021). People that lost their jobs also lost their will to search for a job in the conditions of a great health crisis so the two effects compensated and the overall pandemic's effect on the labour market was diminished. In the line



with these effects, EU countries implemented short-time work programmes targeted at the workforce, whose sectors slowed down and reduced working hours. In this way, they stayed employed and an employer got a subsidy for their salaries (Eyméoud et al., 2021).

Significant differences in the defined index for this research purpose were captured between geographical clusters of countries. Specifically, noteworthy differences were identified between labour markets of Western Europe and Southern Europe, Western Europe and CEE, and CEE and Southern Europe for 2020, while in 2021 differences were captured between Western Europe and Southern Europe and Western Europe and CEE. No difference between Western Europe and Northern Europe was recorded in 2020, while in 2021 there were no differences between Western Europe and Northern Europe and CEE and Southern Europe. These results are an extension of the previous notation that according to the developed index, individual EU labour markets did not change their overall position. Therefore, it is reasonable to assume that the differences between clusters of countries are inherited and that labour markets in the EU have more than clearly shown resilience to the shocks caused by the Covid-19 pandemic by withholding disparities among clusters. Although significant support was provided through EU countries' participation in the budget intended to mitigate unemployment, named *Support to Mitigate Unemployment Risks in Emergency (SURE)*, the measures defined under the JRS resulted in the upbringing of labour market resilience while the economic downturn was much bigger. The majority of JRSs were withdrawn by France, Germany, Italy, Spain (Ando et al., 2022) and Luxembourg (Barbier-Gauchard et al., 2021). Therefore, the unemployment rates did not change in these countries through 2020, with exception of Spain, which faced a major increase followed by France. Compared to the United States and their labour market policy without short-term work programmes, EU countries successfully maintained their employment rates during the pandemic (Eyméoud et al., 2021). EU represented by countries France, Italy and Germany did have unprecedented success in curbing unemployment but the number of working hours decreased as in the US. Differences between EU countries, in the case of labour market indicators, such as the unemployment rate, could be connected to the influence of the number of COVID-19 cases. While COVID-19 cases could not be related to the unemployment in France and Spain, the cluster of Germany, Italy and the UK was faced with the strong influence of COVID-19 cases on the unemployment rate. On the other hand, in Italy and UK deaths caused by COVID-19 are also connected to unemployment (Su et al., 2021). When it comes to Poland, Bulgaria, Slovakia, Finland and Czech Republic, the JRSs were much less used in these countries. Moreover, some countries such as Italy even before the COVID-19 pandemic had used JRSs for a worker in the industrial sector, while, for example, the Czech Republic introduced this scheme in 2020 and shortly after in spring 2022 terminated the program (Pavolini et al., 2022). Therefore, the identified differences in the composite index of geographical clusters of countries are expected in two representative periods and, as previously stated, they are the result of inherited labour market disparities rather than caused by coronavirus consequences.

The COVID-19 pandemic again shed the light on the disparities that exist between EU countries in the context of the labour market and social protection systems. The SURE program and its budget for mitigating crisis effects in some countries were combined with national social protection systems for unemployed workers. Once more, the question of the necessity of social protection systems harmonisation within EU countries arose (Barbier-Gauchard et al., 2021). Differences were also observed in the way of tackling the negative effects of the COVID-19 crisis. Specifically, the majority of countries were implementing JRSs, but some countries used wage subsidies to protect against labour hoarding (such as Bulgaria, Croatia, Latvia, Lithuania, and The Netherlands) (Ando et al., 2022).

## Conclusion

The COVID-19 pandemic has raised a vast number of problems in all economic sectors and markets, and one of them is the labour market. Therefore, the authors of this paper investigated the differences between EU countries by calculating a composite index made of ten labour market indicators in order to assess the differences between labour markets before and during the COVID-19 crisis and to conclude about the sustainability of this market. For this purpose, the MOORA method of composite indexes' development was applied. The research has revealed that, when it comes to EU labour markets, differences comparing three years' labour market indexes were not proven, while the differences on a country level were noted. On the other hand, significant differences were found among groups of EU countries that belong to the same geographical cluster. Western Europe and Southern Europe, Western Europe and CEE, and CEE and Southern Europe were identified as different in terms of the developed composite index for 2020, and only between Western Europe and Southern Europe and Western Europe and CEE when it comes to the composite index for 2021.

These differences probably were not caused by the COVID-19 pandemic but may have been encouraged by the use of JRSs and wage subsidies as reactive measures for curbing negative labour market effects during the pandemic. Even though these common measures emerged as positive for the overall EU labour market and the EU unemployment rate increase was restrained by them, on the individual level, the countries have used different programmes (JRSs, wage subsidies or both) and withdrew different amounts of budget for social protection systems. The beneficial effects of employees' retainment and not laying them off because of the crisis are that workers

and firms retain their performances and human capital while negative consequences of unemployment are bypassed. Moreover, the cost of firing employees and afterwards their recruitment, selection and socialisation when the crisis is over, are significantly decreased by the JRSs implementation (Barbier-Gauchard et al., 2021). Besides positive effects and the developed resilience to the COVID-19 labour market effects, the labour market indicators, and the composite index developed on their basis, are pointing out that there is a need for one harmonised EU labour market policy and social protection system that will mitigate labour market disparities and crisis effects in the long run. By doing this, EU countries will lessen the problem of workers' migration caused by unfavourable labour market conditions in order to contribute to the sustainability of the EU labour market.

Although the study results are rather indicative, the study has its shortcomings. Further research on this topic could be expanded and new labour market indicators introduced in order to increase the representativeness of the results. Additional forms of research can be directed to the application of comparative methods of composite indices' calculation in order to confirm the results obtained in this study.

### Acknowledgement

This paper is part of a project that has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101059994.

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