RELEVANT ASPECTS REGARDING LABOR FORCE MARKET IN THE CONTEXT OF POST-COVID-19 AND THE TERRITORIAL COHESION

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Abstract: *At global level, the impact of the COVID-19 pandemic displays a general character affecting both humans and economies, under the current post-Covid conditions. At present, it is obvious that the effects of the crisis (either negative or positive, direct or indirect, on medium- and long term) are not well known. Thus, little is known yet about multiple other coordinates: time, magnitude, reactions at sectorial or territorial level, etc. In this mixture of unknown we find the individual regarded from the social (demographic-social) and economic (labor force resources) perspective. However, a series of obvious effects are identified by which the sanitary crises impact on the lives of people – from the personal one to the professional one. These changes might be considered as development opportunities but, at the same time, they might lead to increased socio-economic territorial disparities.*

Looking ahead, the pandemic accelerated the ongoing digital transformation of the UE economy, with teleworking and the use of digital technology becoming more prominent.

Taking into account the fact that diminishing territorial disparities remains the strategic objective of the current territorial Cohesion Policy, the present paper attempts to provide an updated image on the effects of the pandemic crisis at regional level and regarding the state/existing trends on the labor force market.

This article is focusing on resilience of labor at European regional level. The results of the analysis indicated the potential and the importance of labor forces in the context of territorial resilience and post pandemic Covid crisis.

Keywords: *COVID-19, regional development, convergence/divergence, work force, mountain area, territorial cohesion*

JEL Classification: *R10, R50, R51, R58, R59*

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1. Introduction

In the European Union, the subsequent evolution of the COVID-19 pandemic was characterized by the following premises (Eurostat Database, 2020):

1. the number of available intensive care beds – it was essential for the pandemic and supported the capacity of a region to mitigate rapidly the emerged outbreaks: related to 100,000 inhabitants, the lowest number of beds was in Portugal (4.2 intensive care beds) and the highest in Germany (29.2 intensive care beds);
2. the nature of the containment measures – these varied a lot between EU regions, from total lockdown to freedom of movement;
3. the number of employees in the healthcare field – this factor determined obvious territorial models; by and large, higher weights of labor force in healthcare in total labor force are found predominantly in the northern Europe countries, and the lowest in the east-European countries;
4. the digitalization degree and the presence of the IT infrastructure, access to internet, the employed population structure in fields where work from home is possible, and the ones for which the physical presence is obligatory;

The pandemic and the reaction measures generated a wide spectrum of differentiated impacts at territorial level (negative and/or positive).

Regarding the labor force market, we might say that, many effects were negative, but some of them was positive one (opportunities).Thus, the regions with economies depending on sectors that were strongly affected by the crisis (for instance, tourism, transports, etc.) had more to suffer compared with the ones with diversified economies or at least less dependent on certain sectors, and that faced better the shock. At the same time, the regions depending strongly on trans-border workers, on international trade specializations, or on international value chains were particularly sensitive as result of borders' closing and movement restrictions.

Thus, in a first stage of the pandemic, and depending on the type of activity, resort was made to measures of maintaining afloat the labor force (for instance, premises and conditions were created for working from home, telework, etc.). At the same time, the employees with higher education have easily used the new telework schemes, compared to the others. This led to increased territorial social inequalities, to social exclusion, in particular in the regions with a labor force with lower levels of professional training.

In the conditions generated by the health crisis, it was noticed that the structure of labor force employment experienced a reorientation trend towards non-manual jobs, to higher autonomy, and lower routine, using ITC and fewer physical tasks, and more activities of intellectual nature based especially on digital competences.

The new forms of labor in the conditions of the COVID-19 pandemic crisis (telework, platform work, on-line orders, etc.) imposed high digital skills, a slight fall in early school-leaving, and an increase in adult participation to training/skilling/far-distance education (online). Those who were not able to access the internet, next to various social categories regarded as vulnerable (low-skilled individuals, youths, women, migrants, etc.) were affected to a larger extent.

At the regional level, the knowledge economy made the difference and directly influenced the capacity of the region to maintain/attract/generate high-skilled jobs. Thus, during the pandemic, infrastructure and digital services became crucial for telework and for online education. For workers, telework and commitments based on ITC determined higher work flexibility, increased autonomy of jobs and less commuting time, etc.

Due to the nature of the process, telework is regarded as an employment opportunity for persons with various disabilities, for elderly workers, and for people living in the rural or peripheral areas, etc. At the same time, it might be a restriction, and a reason for more marked social inequalities, between those who can work from home, and the ones who do not have this possibility (they do not have access to a good broadband connection, they do not have the necessary equipment, and have no digital skills, etc.).

If we were to have an overview of the regions, we may find that the digitalized jobs are concentrated especially in cities and urban areas. Statistical data have shown that towns have more telework jobs (44%), compared to the suburbs (35%) or rural areas (29%). Moreover, in large cities, about 61% of the employees resorted to telework, against 41% living in small towns. The concentration of the telework activity in urban areas is the result, mainly, of the broadband coverage and of the specific infrastructure (Eurostat Database, 2020).

At the level of the rural areas, ten out of one hundred households are not covered by any fixed network, and 41% are not covered by any rapid broadband technology. In 2009, access to the internet varied between urban and rural areas, about 92% from the towns and suburbs had access to internet, compared to 86% in the rural areas (Eurostat Database, 2020).

On the background of these realities, a large number of towns and regions were affected significantly by the immigration of skilled or semi-skilled workers (originating from other regions), coming preponderantly from peripheral, less developed areas of the EU.

In the conditions of the current pandemic, at community level, the spatial dynamics of labor force employment and the imbalanced distribution of employment opportunities laid their fingerprint on the Regional Cohesion and Development Policy by polarizing the increase of regional disparities and imbalanced development between urban and rural areas. This polarization leads to the emergence of new labor force employment models at regional level,

in the conditions of increased interest for the knowledge economy and digitalization (Antonescu, 2013).

We might assert that the current health crisis favored by far the activities based on digitalization and regions that had the adequate infrastructure, especially, the so-called knowledge regions (Acuto, 2013). At the same time, it is found that affected were the regions with low levels of broadband infrastructure, with low internet access, and the ones where the population had less experience regarding 'digital life', and those with a higher share of old-age population, but also the regions relying on a single sector (for instance, tourism, etc.).

Taking into account the above-mentioned, ***the main objective of the article is to identify the characteristic trends and models for the labor force market over the period of the pandemic crisis, at EU level, national, regional and local level.***

2. RESEARCH METHODOLOGY

In this paper the indirect research technique was used, consulting various sources by collecting and processing information from articles addressing similar topics, based on scientific research published so far and online available information (official and specialty sites). This study presents a brief analysis of the importance of the work-force in the context of pandemic crisis.

The research methods used in the paper are: documentation and computing statistical data regarding pandemic crisis and it effect on labor force, practical and theoretical documentation, through the analysis of the literature, in this sense being studied numerous books, studies, national and international articles; statistical methods, such as classification and synthesis and the method of interdisciplinary researches.

The methodology was based on the following steps:

Research question	How did the labor force market react during the Covid-19 crisis? What were the opportunities and challenges that resulted? What are the political measures to support the post-pandemic?
Objectives	It aims to capture the defining aspects of the evolution of the labor force market and to provide an overview of the factors and aspects that characterize this sector before and during the SARS-CoV-2 pandemic crisis.
The combinations of keywords on which the research	"Labour market"; "Covid-19"; "Resilience"; "Opportunities"; "Challenges"; "Digital transformation"; "Regions", "Strong points"; "Weaknesses"; "Threats", Recovery, resistance, recovery, recovery, etc.

Search engines	Google Scholar, RePec, Google Scholar, Publons, Elsevier, Springer Virtual Database, Scielo, Scopus, Web of Science, ProQuest, Science Direct (Elsevier), Scientific Reports, Reports, Conferences. Data sources: EUROSTAT, INS, Forecast Commission.
Year of publications	2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021.
Selection criteria	Search for keywords in the title and abstract; Most cited articles, Most cited studies; ratings.
Data extraction methods	Analysis of text, context, data. Focus on goals and results. Research refinement. Proposals.
Conclusions	Analysis of research results. Creating bibliography Data verification.

3. STATE OF THE ART

Before the COVID-19 crisis, economic growth in member-states pursued financing human capital and research-development-innovation investments. The increase of access to knowledge and information and communication technology (ICT) allowed European economies to evolve and changed the structure of the skills required on the labor force market, that is, the demand for workers with high training/skill levels. In other words, the development of the knowledge economy was promoted as "apt to generate knowledge from technologies and/or from formal and informal links with other economies".

In parallel, the knowledge economy led to the emergence of those knowledge regions, regions "specialized in high technology sectors, with scientific functions, or apt to generate knowledge by means of cooperation and networking". These played an important role in implementing research-development-innovation projects at community level, unlocking the local innovative potential, in disseminating obtained results, and in creating technological "bridges" that would contribute to increasing competitiveness of the European economy. With the purpose of adjusting to the new changes occurring at regional level, Structural Funds support further the research-development activity and investments in the specific infrastructure, including the promotion of technological transfer centers, of clusters, regional networks and entrepreneurship, etc.

The direct effect of the knowledge economy is the emergence of a new category of workers that is knowledge workers. These are defined in the specialized literature as skilled

individuals, apt to change knowledge into tangible, innovative products or services, and who can transfer competences and knowledge to other persons.

The concept of knowledge workers is not new, as it was mentioned for the first time by Peter Drucker who coined this phrase in his book The Landmarks of Tomorrow. The definition is focused firstly on the theory of knowledge and the way in which this way of thinking/research/analysis might aid companies to develop their supplies. Drucker mentioned, as well, that "knowledge workers are the most valuable assets of 21st century organization, due to their high level of productivity and creativity" (Drucker, 1968).

Peter Drucker shows in his book Postcapitalist Society (1993) that the changes in the significance and importance of knowledge began 250 years ago, when important changes were noticed in the economy and society as result of scientific progress. Formal knowledge is regarded both as a resource (quality) of the individual, and of the organization or economy as a whole. Moreover, Drucker focuses on the differences between the "productivity of the manual worker" and of the "worker making use of knowledge", pursuing the flexible use of knowledge, workers autonomy, continuing innovation, quality-based-assessment (not just quantity), perceiving workers as organizational assets. Even though this analysis is useful, Drucker did not take the additional step of specifying which are the occupations that may be assimilated with the knowledge worker (Drucker, 1968).

Resorting to a series of analytical tools, Robert Reich (1992) was more explicit in defining what he calls "symbolic analysts", respectively those employees getting involved in the non-standardized problem-solving. The key to success for these workers is given by creativity and innovation, specific occupations being as researchers, consultants, financiers, etc. (Reich, 1992).

In regional theory, the spatial distribution of economic activities is determined by the presence of positive externalities inducing competitive advantages. The economic activities based on knowledge tend to be placed preponderantly in the urban areas that provide high levels of human capital with high professional training (tertiary, post-tertiary) and good physical access (all types of infrastructure) (Daugeliene, 2007).

The uneven distribution of the knowledge economy in the EU regions had as consequence the increased mobility of high-skilled and well-trained professional workers to fields providing opportunities related to incomes and the possibility of practicing their trade in optimum conditions. In this respect, we remind here the recent report of the European Commission showing that, in 2019, about 13 million working age individuals traveled between the member-states, confirming thus that intra-EU mobility has an increasing trend with a lower rate than in the preceding years. Another report shows that 34% from the persons who travel within the EU had tertiary level education, being regarded as "high-skilled" (compared with the year 2009, this share is by 9% higher) (European Commission, 2020).

The most important countries receiving a high-skilled workforce are: Austria, Belgium, France, Germany, and Spain. Before the exit from the EU, Great Britain was the destination with most high-skilled immigrants. The main countries from which high-skilled labor force leaves are: Italy, Poland, Romania, Bulgaria, and Portugal. The migration patterns are in agreement with the spatial distribution of the knowledge regions (Milasi, Bisello, Hurley, Sostero and Fernández-Macías, 2020).

In the regions of the European Union, the economic activities are unevenly distributed, hence the economic growth becomes geographically unequal. Public authorities must play an important role to ensure that the economic catch-up process will be sufficiently rapid. For this, they must implement a strategy of local growth to correct spatial inequalities and to help the regions which have been less favored by nature and history. The spatial distribution of the economic activities is not based solely on cost considerations (Regional cohesion and policy, 2019).

The company mixed multiple resources in skills, informal relationships, technologies, etc. These resources are not present everywhere, which generates an unequal distribution of the economic activities and therefore an uneven regional development.

The concentration of firms in the same area induces advantages that can be explained in quantitative terms by improving the efficiency of division of labor, cutting production costs and raising factor productivity by resulting economics of scales. Thus, the dynamic location of economic activities as well as of growth, relies heavily on the dissemination of information and especially on the transmission of tacit knowledge held by workers.

4. RESULTS AND DISCUSSION

4.1. The results of analysis

By the beginning of the month of March 2021, at European level, the Action Plan of the Social Rights Pillar proposes a set of specific actions and main targets for labor force employment, competences, and social protection. From the perspective of the time-horizon 2030, the pursued reference indicator is an employment rate of at least 78% (from 72.3% in the present) for individuals aged from 20 to 64 years (Eurostat database, 2021).

- in 2020, a demographic analysis at the level of the countries shows that: the population aged 15-74 years was by 332,5 million persons, while the active population was by 211,7 million individuals;
- about 120,8 million persons were registered as outside the labor force (economically inactive persons: school-age children, students, pensioners, persons taking care of family members, as well as volunteers, and persons unable to work because of illnesses or long-term invalidity) (Eurostat database, 2021);

- labor force consisted of 196,7 million employees and 15 million unemployed (who do not work but are actively seeking, being available to work);
- the employment rate of the working age population (20-64 years) was by 72.3%, on decrease by 0.8 p.p. compared with 2019 (Eurostat database, 2021).

At the regional level, the rural areas, populated weakly or peripheral, registered low shares of labor force employment. It is the case for the regions of southern Spain and southern Italy, for a large part of Greece, the ultra-peripheral regions of France and many of the rural areas in Eastern Europe (from among which some remain characterized by the semi-subsistence agriculture). The majority of these regions were characterized by lacking employment opportunities for the highly-skilled labor force. At the same time, the former industrial regions represent a group of regions where the employment rate is relatively low. Many of the rural areas were affected also by the globalization process, especially for traditional fields (coal extraction, steel or textile manufacturing, etc.). We mention here the regions of north-eastern France up to Région Wallonne (Belgium).

At the opposite pole, the highest regional labor force employment shares were concentrated in southern Germany (shares over 84.0% were recorded in Oberfranken, Schwaben, Tübingen and Oberbayern), in the insular region Åland (Finland) (86.5%) (Eurostat database, 2021). More than a quarter of the regions (65 from the 240 regions for which data are available) had a labor force employment share below 70.0%.

At territorial level, there is a stark contrast regarding labor force employment rates between capital-regions and the other regions. For instance, in most of the member-states from the eastern area and the Baltic one, capital-regions recorded the highest employment rates (in Bulgaria, Croatia, Lithuania, Hungary, Poland, Slovenia, Slovakia, Romania), while in some member-states from the western hemisphere (Belgium, Austria), these were at the minimum level.

4.2 The effects of the pandemic on labor force employment

The COVID-19 pandemic and the associated measures affected the EU labor force market as of the end of the first quarter of 2020. Yearly statistics have shown that the labor force employment rates at regional level (20 to 64 years) decreased between 2019 and 2020, in 169 from the 240 NUTS-2 regions (70.41%). Nevertheless, there were 61 regions (25.42%) where the employment shares increased, while no change was recorded in 10 regions (Eurostat database computing, 2021).

The employment share dropped rapidly in regions characterized as main holidaying destinations. Thus, between 2019 and 2020, the labor force employment share in South Aegean (Notio Aigaio) and Crete (Kriti) (Greece) decreased by 7.3 p.p., respectively 5.1 p.p., while decreases by 6.1 p.p. were recorded in Balearic Islands (Illes Balears) and 4.3 p.p. in the Canaries (Canarias) (Spain) (Eurostat database, 2021).

To the contrary, the regional labor force employment shares increased in the majority of the regions from Poland (2019 vs. 2020), recording increases by over 2 p.p., in the central regions Łódzkie and Świętokrzyskie. The highest increases were registered in Corse and Languedoc-Roussillon (southern France), where the employment shares increased by 4.5 p.p., respectively 3.1 p.p. (Eurostat database, 2021).

At the time of writing the present paper, the pandemic is still unfolding. The policy measures attenuated to a certain degree the impact of the crisis on the labor force markets, compared with the swifter contraction of the gross domestic product (GDP).

The crisis affected certain groups on the labor market, especially youths, temporary/ seasonal employees, persons working in leisure, hospitality and transport.

At the EU-level, in the year 2020 compared with 2019, the total labor volume (the effective number of hours worked) decreased by 13.3%. The vast majority of the regions, 94%, registered a decrease in the effective number of hours worked, while the total labor volume increased in 12 regions (5%) (Eurostat database, 2021).

The impact of the COVID-19 pandemic on the effective number of hours worked (2020 vs. 2019) was higher in the regions from the southern region, while northern and eastern regions were, in general, less affected (Boterman, 2020).

Some of the highest drops in total volume of labor (2020 vs. 2019) were recorded in the popular holiday destination. This phenomenon was registered in the regions Notio Aigaio, Ionia Nisia, Kriti (Greece), Illes Balears and Canarias (Spain), where the number of hours worked decreased by over 30% (the highest decreases at regional level within the EU). There were yet another seven regions where the total number of hours worked was reduced by 25%, and some of them were also popular holiday destinations – Mittelfranken, Koblenz (Germany), Algarve, Região Autónoma da Madeira (Portugal), Ipeiros (Greece), Molise (Italy) and Champagne-Ardenne (France).

At the same time, during the pandemic, the companies were forced to operate temporary layoffs that affected about 2.8% of the employees (2020). We might remind here regions such as Canarias, Illes Balears (Spain), Notio Aigaio and Ionia Nisia (Greece), where one out of 10 employees were laid off temporarily (with a maximum of 14.5% in Canarias). To these were added also other regions considered as popular holiday destinations: Cyprus, Madeira, Algarve (Portugal) and Cataluña (Spain), regions affected by temporary layoffs of labor force.

Layoffs because of employees' own illnesses or disabilities of the employees did not change considerably (2.1% in 2019, and 2.2% in 2020). A maximum of the value for this indicator was reported in the Ceuta region (Spain), by 8.0%, and in some Spanish and French regions, as well (the weight of leaves of absence due to illness/disability was double against the EU average) (Eurostat database, 2021).

An important characteristic of the pandemic was the work from home for employees. Thus, compared with the year 2019, when one out of 20 employees worked from home (about 5.5%), this weight doubled in 2020, and reached 12.4% out of the total.

In the year 2020, the regional distribution was somewhat distorted: about 94 NUTS-2 regions reported a abor force working from home over the EU average, compared with 134 regions that had lower shares than the average. In some capital regions, the weight was much higher compared with the community average. Thus, in Helsinki (Finland's capital), about 37.0% of the employees worked from home (2020), and this is the highest share at EU-level. Other examples that may be mentioned in the context are: Brabant Wallon region (Belgium) by 26.5%, Brussels by 25.7%, the eastern and central regions from Ireland (24.7%), Vienna (Austria) by 24.2%, Hovedstaden in Denmark by 23.6% and Île-de-France by 23.4%. At the same time, ten regions were identified within the EU where at least one fifth of the labor force worked from home, these being mainly urban regions (Eurostat database, 2021).

Work from home was less found in the regions in the south-eastern regions of the EU. In the year 2020, below 5.0% from the labor force worked from home in some regions in Croatia, Cyprus, Latvia, Bulgaria, Greece, Hungary and Romania (the only exceptions being the capital regions Budapest and Bucharest-Ilfov).

An analysis on areas of residence shows that the share of employed persons working from home was higher in the case of capital-regions and in the urban ones. An average of the persons working from home in the EU (2020) was by 12% with higher values in the regions mentioned above (Eurostat database, 2020).

The increase in the numbers of persons working from home reflects, at least to a certain extent, the economic nature of the respective regions that provide higher opportunities for those employed in professional sectors such as finances, ICT, education, in certain governmental structures, etc. By contrast, there were lesser opportunities of working from home for individuals employed in manual occupations such as in agriculture, manufacturing, distribution, etc.

Regarding the evolution of unemployment during the pandemic, at the level of the EU-27 regions, were registered 15 million unemployed (15 – 74 years), and an unemployment share by 7.1% (in 2020 against the average by 6.7% in 2019). After six consecutive years of unemployment drop, this share marked the first increase (after 2013). The highest unemployment shares were in the southern and ultra-peripheral regions of the EU, while the lowest were found in a group of regions in southern Germany, in the Czech R. and in the western regions of Poland and Hungary (Eurostat database, 2021).

In 2020, unemployment shares by 16% were recorded in 11 out of the 13 regions from Greece (exception: Peloponnesus and Athens), five regions from southern Spain, as well as in the two island-regions, four in the ultra-peripheral regions of France, and three in southern

Italy. At the opposite pole, the lowest shares of unemployment were registered in Wielkopolskie, Poland (1.8%), Střední Čechy (1.9%) and Jihozápad (2.0%) (Czech R.). An unemployment share of only 2.0% was reported in three regions from Germany: Niederbayern, Unterfranken and Trier (Eurostat, 2019).

On the whole, at EU-level, 160 NUTS-2 regions (66.66%) reported higher shares of unemployment, as the situation of the labor market underwent a sudden drop, while the most affected regions were those regarded as popular holiday destinations. There were also some regions that reported decreases in the unemployment rate (2019 and 2020): Dytiki Makedonia region from Greece (decrease by 4.9 p.p.), three ultra-peripheral regions from France - La Réunion (decrease by 3.9 p.p.), Guyenne (decrease by 3.2 p.p.), Guadalupe (decrease by 3.1 p.p.), Ciudad de Melilla (Spain) (decrease by 3.3 p.p.).

Unemployment among youths (15-24 years) had an increasing trend from 15.1% in 2019, to 16.9% in 2020 as result of the pandemic crisis and measures taken (Eurostat database, 2020).

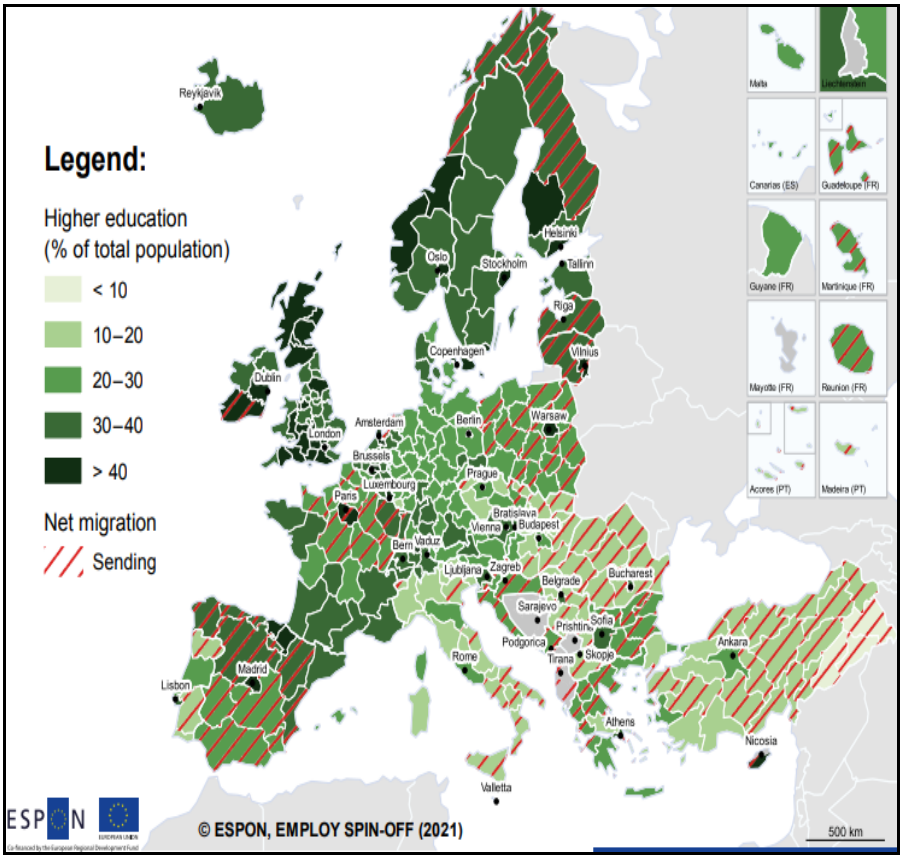
Another indicator is the unemployment share among youths (based on the same principle as the unemployment share among the working age population; not all youths are in the labor market). Hence, it is possible that the unemployment share among youths is somewhat erroneous. For instance, when the unemployment share among youths is by 25%, this does not mean that one quarter of the youths are unemployed. Rather, one quarter of these youths who are in the labor force are unemployed (and three quarters are employed), while youths outside the labor market, for instance, might be continuing to study.

The lowest unemployment shares among youths are found in a group of regions covering an area from the northern half of Belgium, crossing over a large part of the Netherlands and Germany (the data are for NUTS 1 regions and refer often to 2019), the largest part of Austria and Czech R., and in many of the Polish regions. At the same time, relatively low shares of youths' unemployment were in the Provincia Autonoma di Bolzano / Bozen (Italy), Közép-Dunántúl (Hungary; 2018) and North-East (Romania). By analyzing minutely, the lowest shares of youth unemployment were recorded in Bayern, in Germany (4.8%) and in the capital region of the Czech R., in Prague (5.0%) in 2020 (Eurostat database, 2020).

High shares of youth's unemployment were concentrated especially in the southern part of Europe. Thus, there were 22 regions in which more than 40% of the labor force (15-24 years) was unemployed (2020). This group included eight regions from Greece, seven from Spain, four from southern Italy, and three ultra-peripheral regions in France. There were identified, also, five regions – largely peripheral – where the unemployment share among youths was over 50.0%: Ciudades Autónomas de Ceuta and Melilla (two regions) and Canarias (Spain), Sterea Ellada (Greece) and Mayotte (France).

In the year 2019, the tertiary education graduation rate for the majority of the EU-28 regions recorded a substantial increase compared with the year 2015, from 29% to 33%. In parallel,

the inequalities between regions persisted, and were even more marked. The share of population with finalized tertiary education (2019) varied from a minimum level by 11.8% (North-East, Romania) up to a maximum by 72% (Inner London-West, UK). In general, the highest rates of tertiary education are recorded in the regions from the northern and western EU-28 (Map 1, Eurostat database, 2020).



***Map 1**: Regions with higher education (%)*

Source: ESPON Programme, CE 2021.

4.3. The effects of the pandemic on labor force employment

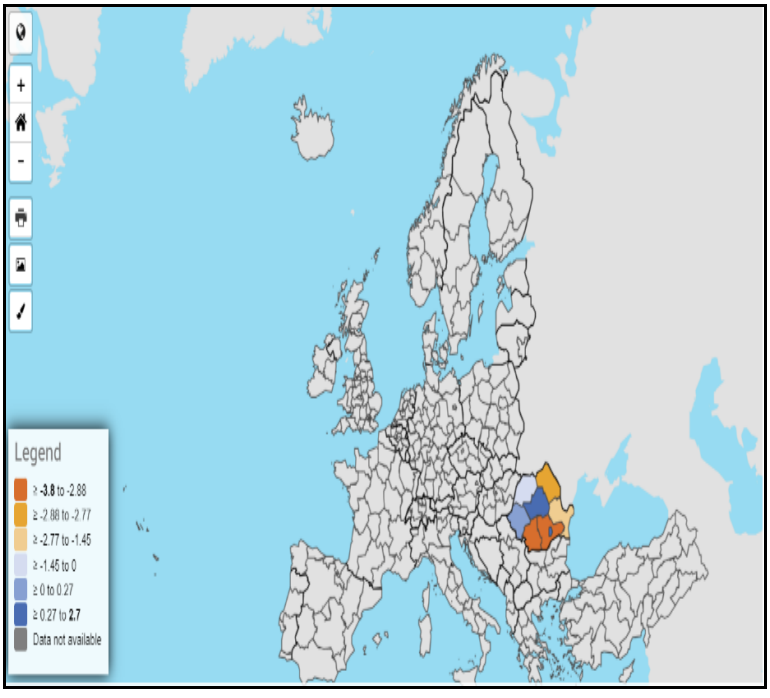
The migration phenomenon displays an uneven territorial evolution. Urban centers are, in general, winners of population, while the peripheral regions and rural areas lose inhabitants, being exposed to the risk of depopulation. Whenever the migration patterns are correlated

with the existing economic conditions, it is obvious that the regions with higher GDP per capita levels and more and better paid jobs are faced with migration inflows.

At the same time, the "less developed regions", or the "transition regions" characterized by lower levels of the GDP per capita and of employment have higher emigration shares as these are known as labor force supply regions (donors).

By analyzing the map below, we notice that all development regions from Romania (save for the capital-region Bucharest-Ilfov) are within the labor force donor regions. In the same situation are also Spain, Bulgaria, the southern part of Italy, and the northern regions of France. The countries attracting labor force are the lander in Germany, the Netherlands, Denmark, and the southern region of France.

In Romania, the main labor force donor regions are: South-Muntenia and South-West Oltenia, North-East and South-East, these recording net negative migration rates by -3.8 per 1000 inhabitants, respectively -2.9 per 1000 inh., -2.8 per 1000 inh. and -2.7% per 1000 inh. The regions Bucharest-Ilfov, Centre and West are regions that receive labor force, the migration rate being positive for all three cases, respectively +2.7 per 1000 inh., +0.3 per 1000 inh., respectively +0.1 per 1000 inh. (Map 2; Eurostat database, 2020).



Map 2: Crude rate of net migration (plus statistical adjustment) (%)

Source: Eurostat.

4.4. Regional models based on migration and knowledge

An analysis of employees in knowledge sectors at EU-27 level shows that there are several clusters formed within a region where the share is higher, surrounded by other regions where this share is lower. As a rule, it might be observed that these knowledge regions are capital regions (Rome, Bucharest, Paris, Amsterdam etc.). It is also found that peripheral regions have, as a rule, labor force less employed in knowledge sectors, and the regions from northern EU are more characterized by knowledge regions than the ones in southern or south-eastern EU.

The ESPON EMPLOY Project applied the methodology pursuing both existing market conditions at regional level, and the presence of highly skilled and educated population, based on the following fields/indicators:

- labor market: inactive population rate (18-24 years), youths employment rate (15-24 years), adult employment rate (25-64 years), youths unemployment rate (15-24 years), adult unemployment rate (25 years and over);
- population migration and dynamics: gross rate of natural change, gross rate of net migration (the dependency ratio);
- knowledge potential: total inter-branch expenditures in research and development (gross expenditures for RD as share in GDP, human resources in science and technology, the share of population aged 30 to 34 years with tertiary education;
- the context indicator expressed by regional GDP (PPS) per capita.

As a result of applying the methodology developed by the ESPON Programme, the following territorial concentrations (clusters) resulted (Table 1).

Table 1: Characteristics of European Knowledge Clusters, 2020

Cluster 1 – comprises metropolitan areas based on knowledge and financial services. It consists of 39 regions, characterized on a large scale by the presence of large European metropolitan and financial areas: Amsterdam, Berlin, Dublin, Hamburg, London, Luxemburg, Oslo, Paris, Stockholm and Zurich, but also Budapest, Madrid and Prague. In these regions, GDP per capita is over 50,000 EUR with the highest level of education, and minimum values regarding total unemployment, unemployment among youths and a very high employment rate. The demographic indicators show an	***Cluster 2*** – they contain attractive areas, based on the knowledge economy. It is composed of 121 strong regions Cluster 2 – comprises attractive areas based on the knowledge economy. It consists of 121 regions characterized strongly by innovative drive: the research-development expenditures as share from total GDP are higher than the average (2.1% versus 1.6%); and the average GDP per capita is by 6,000 EUR over the European average. Labor market conditions are rather similar with the ones in the metropolitan areas from Cluster 1, and the share of persons aged between 30 and 34 years with higher education is above the European average.

unusual situation for Europe: a positive natural change rate of the population (2.8%), and a high net migration rate (5.4%) despite the fact that it indicated a negative trend compared with the 2013-2015 average, accompanied by a dependency ratio for old age (% from the population aged over 65 years, compared with the working age population), the lowest within the EU. Next to the regions in Cluster 2, these urban areas represent the true engine of Europe	In general, this cluster represents the second most important group of regions with a strong migration inflow and a high positive rate of net migration (4.1%). However, the population natural change rate is negative (-0.9%). In this cluster, all indicators show a significant improvement as compared with the years 2013-2015. From a geographical perspective, this cluster includes Austria, Denmark, Flanders (Belgium), Germany, northern Italy, some Scandinavian regions and the United Kingdom
Cluster 3 - comprises less attractive regions regarding the knowledge potential, being formed out of 104 regions grouped into two distinct blocks, that is geographically far regions, but similar in their economic and demographic aspects. The main regions are on one hand in central France, Italy, Portugal and northern Spain, and on the other hand in the eastern regions of the EU, such as Bulgaria, Poland, Romania, and the West Balkans regions for which data are available (save for the capitals). This cluster has an economic and labor force market with weaker conditions than in the previous clusters: the employment level is below the EU average, and the unemployment rate is slightly above the average. The income per capita does not reach 25,000 EUR. Knowledge indicators are slightly below the EU average, despite a positive trend compared with the period 2013-2015. Regarding the demographic conditions, these regions are characterized by a stable population with a positive net migration rate (2.3%) that compensates for the negative natural population change (-2%), but with a high and increasing dependency ratio.	***Cluster 4*** – represents depopulated regions with low knowledge potential. It consists of the most depressed economic regions (37 regions) characterized by labor markets with structural difficulties and depopulation dynamics. From geographic perspective, these are positioned at the southern borders of Europe, oriented towards the Mediterranean. This cluster consists of regions with a negative net migration rate (-0.5%), a negative population natural change rate (-1.2%), though lower than the one in Cluster 3. The average GDP per capita in these regions is only 62% from the EU average, with the lowest average values for the knowledge indicators. The average employment rate (25-64 years of age) is by only 61.2% as compared with Cluster 1, while youth employment is by 15%, compared with over 40% in groups 1 and 2. The unemployment rate among youths is by 42%

Source: ESPON database, author computations

Based on analyzing the 4 categories of territorial concentrations/clusters, it might be found that the most attractive are the first two, one of the common elements being that these are urban/ metropolitan areas with an important immigration rate (for labor force coming in the region), and a positive value by over 4%. This process influences to a significant degree the economic situation of the region and the development perspectives built on knowledge and innovation.

4.5. Models of the migratory phenomenon in Hunedoara County

From the perspective of local development, Hunedoara County has 69 TAU (Territorial Administrative Units). The migratory phenomenon registered in these mountain localities has a main characteristic, namely that, in the period 2014 - 2020, the number of emigrants is higher than that of those who have definitively settled in the locality. Thus, at the level of mountain localities, it is considered that the number of emigrants is definitely higher in cities and municipalities compared to small mountain localities, distributed relatively unevenly in the county. This aspect shows that at the level of mountain localities, there is not an intense process of depopulation due to the migratory phenomenon, but rather of the demographic aging. At the same time, the number of those who have definitively established their residence is higher in urban localities and less in rural-mountain ones (Table 2).

Table 2: Migration phenomena in Hunedoara County, 2020 vs. 2014 (%)

Localities	Immigrants	Emigrants	Localities	Immigrants	Emigrants
BACIA	-100.0	0.0	ORASTIE	100.0	-8.0
BRETEA ROMANA	-100.0	0.0	URICANI	100.0	75.0
MARTINESTI	-100.0	0.0	PETROSANI	150.0	95.1
PUI	-100.0	0.0	SALASU DE SUS	400.0	0.0
TOTESTI	-100.0	0.0	HATEG	600.0	150.0
SIMERIA	-20.0	42.9	HARAU	0.0	-100.0
BAITA	00	100.0	LAPUGIU DE JOS	0,0	-100.0
CALAN	0.0	200.0	LUNCA CERNII DE JOS	0.0	-100.0
GEOAGIU	0.0	0.0	RAPOLTU MARE	0.0	-100.0
PETRILA	0.0	87.5	SANTAMARIA-ORLEA	0.0	-100.0
VULCAN	33.3	0.0	SARMIZEGETUSA	0.0	-100.0
BRAD	50.0	50.0	CRISCIOR	0.0	0.0
HUNEDOARA	56.3	162.2	PESTISU MIC	0.0	0.0
LUPENI	66.7	0.0	LUPENI	0.0	-12.1
DEVA	80.0	168.8	ROMOS	0.0	-33.3
ILIA	100.0	200.0	DOBRA	0.0	-50.0
CERTEJU DE SUS	0.0	-100.0	TELIUCU INFERIOR	0.0	-66.7
GENERAL BERTHELOT	0.0	-100.0	ANINOASA	0.0	-80.0
GHELARI	0.0	-100.0	BAIA DE CRIS	0.0	-100.0
BERIU	0.0	66.67	BRANISCA	0.0	-100.0

Source: author computations based on NIS, Romania,

The Covid-19 crisis has contributed to the displacement of the population from urban centers to small and isolated localities, in an attempt to establish as much social contact as possible.

Due to the low population density, the mountain localities were not affected by the health crisis, so those who had the opportunity turned their attention to them.

Following the discussions with the decision-makers, it resulted that there is a phenomenon of labor migration from urban to rural areas, of establishing residence in peri-urban areas or in localities with tourist / agricultural potential. Thus, economic migrants and retirees settle in mountain areas and contribute to their transformation (Crețan, Light, 2020).

Among the new migration trends, there is the so-called arrangement migration - migrants are moving towards a certain lifestyle, by choosing places with attractive natural landscapes, climate, authentic rural culture, recreation and affordable housing.

This process is not a new one, it was developed in the early 90's by Laurence Moss who observes that there is a tendency for "people to move to the mountains to live year-round or intermittently, mainly due to the quality of the environment and culture differentiated perceived realities" (Moss, 2006) These migrants usually come from highly urbanized centers, and are motivated by a desire to escape negative metropolitan conditions (Moss, 2006). This category of migrants led to an infusion of increasing the capacity of economic, institutional and physical infrastructure in the host region (2006), including the increasing pressure on local social and health capacities, environmental resources, cultural and recreational facilities, retail services and residential housing (Williams and Gill, 2004).

Mobility and based migration are reshaping many rural areas. In a negative sense, they can cause strategic constructions for sustainable development (Pulighe, and Lupia, 2020), geographically extended social networks, an enormous impact on public lands and landscaping, etc.

However, most perceptions of migration and tourism are built on the assumption that people normally live in one place with a high level of mobility support.

5. CONCLUSIONS AND RECOMMANDATIONS

The sudden emergence of the COVID-19 pandemic affected labor force market. First and foremost, states were strengthening their health care capacity in the event that demand for medical services surge. Ensuring there are enough licensed health care professionals is a key component in this preparation.

States were restricting access to in-dining restaurants, theaters, concert halls, some retail stores and other non-essential businesses where large groups of people risk coming into close contact with one another. Additionally, experts have warned people to stay home as much as possible and avoid doing anything that requires close contact with others. Many SME-s had voluntarily closed to protect their employees and the public as a whole. Perhaps the most visible closure has been the nearly universal shutdown of the tourism industry.

In the increasingly uncertain conditions of current developments, the migration phenomenon is affected strongly by the territorial distribution of the knowledge infrastructure and the way in which countries and regions succeed in attracting and maintaining a highly skilled labor force.

These unprecedented challenges had economic ripple effects on the European Union as thousands of Europeans found themselves out of work with the potential for significant increases in unemployment. Member States took action to address employment and to protect those who are no longer able to work. Some immediate issues included expanding paid leave for workers, preparing state unemployment insurance benefit programs for surges in demand and helping businesses transition to full-time teleworking.

In the COVID-19 crisis, the uneven distribution of the knowledge economy in the EU regions had as consequence upon the mobility of high-skilled and well-trained professional workers.

The public authorities must play an important role to ensure that economic resilience of market labor will be sufficiently rapid. For this, they must implement a strategy of local growth to correct spatial inequalities and to help the regions which have been less favored by nature and history. In these conditions, it is known that the process of economic convergence at regional level is one of the main objectives of the EU established already as of its beginnings. Next to cohesion, regional policy aims to support recovery and resilience and promote sustainable economic growth with strong emphasis on less developed regions, by allotting important financing sums for investments.

For achieving its objectives, there is a series of investments financed in fields such as infrastructure, human capital, administrative assistance/technical assistance and institutional capacity. Recently, the knowledge economy was added to these fields, gaining more interest, due to its possibilities of transforming innovation into a process of stimulating sustainable and inclusive regional development.

Post COVID-19 period should bring specific actions that are directed to stimulating research and development, ICT, digital development by increasing participation in tertiary education, attracting skilled migrants and promoting the return of skilled workers who live abroad. This fact is in accordance with EU efforts of the last years for promoting the development of economies based on knowledge and innovation by specific policies.

The investments should focus on valorizing the endogenous potential (all kinds of resources) for increasing the quality of life for inhabitants.

Some south-eastern countries developed at national level regional strategies for stimulating high skilled migrants to return in their country/region of origin, for instance, by fiscal incentives or employment opportunities, and by developing networks of citizens abroad known as strategies aimed at the Diaspora.

Supporting these objectives should lead to resilience, recovery and diminishing structural inequalities and increased regional attractiveness (influenced by the economic, demographic and social conditions, including institutions', and public services' quality, policy inclusiveness, and the local and political climate).

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