

DIMENSIONS AND INDICATORS USED IN THE ANALYSIS OF THE EDUCATION - LABOUR MARKET RELATIONSHIP

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Abstract

The ongoing evolution and rapid transformations occurring in the labor market, influenced by economic progress, are leading to the emergence of novel job roles and substantial modifications in conventional occupations. These changes underscore the importance of adapting educational systems to anticipate the future demands of the labor market, ensuring seamless transitions for individuals from educational institutions to the workforce. Education and employment are interdependent. On one hand, the European Union (EU) and its member states require an effective education system that equips individuals with skills aligned with labor market demands. However, it is also imperative to provide a proficient and inventive workforce market that amplifies efficiency while fostering individual growth and societal integration within the population. The key dimensions frequently analyzed to characterize the state of the education market and evaluate its implications on the labor market include the demand for education (participation rates in education), characteristics of the education supply (financial aid for tertiary education), and outcomes of the educational system (early school leavers, tertiary graduates, youth not in employment, education, or training). To gather relevant information, the statistical database Eurostat, Tempo-online (National Institute of Statistics), as well as data provided by the European Commission, the Council of the Union, and the European Parliament were utilized.

Keywords: *education, labor market, employment, educational system, transition from school to work*

JEL Classification : *I20, I23, J21*

1. Introduction and context of the study

For a long time the interest in education and the labor market has been focused on the effects of education on capital accumulation as part of the economic growth model.

Becker [1] analyzing different cultures and political regimes, observed that economic earnings are positively correlated with education and skill level, while education negatively influences unemployment. In the same period, Selowski [2] analyzed education as a way of increasing the quality of the labor force. Thus, he researched from an empirical perspective the positive relationship between labor productivity and incorporated education, but also taking into account the education expenditures made by the states.

Another contribution was made by Mincer [3] who tried to determine the statistical relationship between wages, education and training on the job, his research was continued in numerous studies. More recent work has shown that different levels of education (primary, secondary, tertiary) and different types of education (general and vocational) can explain variations in wages between individuals [4], [5].

Oancea et al. [6] conducted a study examining the causal relationship between economic growth and higher education in Romania and the Czech Republic from 1980 to 2013. Their findings indicated a substantial positive impact of university-level education on economic growth. Similarly, Jovović et al. [7] investigated the labor market in Montenegro and concluded that disparities between the educational system and labor market requirements can significantly influence economic growth and development. Furthermore, Nikšić Radić and Paleka [8] examined the effects of education funding in Croatia using the "education-led growth hypothesis" and found that increased investment in higher education could potentially contribute to Croatia's prosperity.

In China, a recent study using panel data for the period 1997-2020 examines the impact of investment at different levels of education on economic growth and finds that investment in general education has a negative effect on economic growth, while investment in advanced education can lead to economic growth [9].

The issue of correlating education systems with the requirements of the labor market has become not only a priority at the national level, but also at the European and even global level. The financial crisis, followed by the pandemic crisis, have caused major problems at the European level in terms of unemployment and inactivity rates, especially among young people. Education and training play a central role in enhancing a country's productivity and increasing individuals' prospects of securing not just any job, but high-quality employment opportunities. The educational attainment and skill set of the workforce have significant impacts both at the individual and national levels.

In general, individuals with elevated levels of educational attainment possess enhanced opportunities to secure higher-tier positions within the labor market, thus diminishing the probability of encountering unemployment. If highly educated individuals are unemployed, it may be because they are unwilling to settle for jobs that do not match their skill level and quality expectations. The influence of education extends beyond employment opportunities and also encompasses working conditions.

Furthermore, higher levels of education are correlated with higher wage levels [10]. Even in cases of overqualification, where individuals are employed in positions that require lower skill levels than they possess, they tend to earn more compared to those in the same job with lower skill levels [11].

More recent work tested whether students' salary expectations are realistic, but also whether there is any relationship between future salary and what type of school they attend. Thus, it has been proven that the salary expectations of students are higher than the realistic offer of employers and that graduates do not differentiate between salary expectations depending on the school they attend [12].

A dilemma has emerged in developing countries regarding whether to promote or restrict access to education. Previous studies have indicated that while augmenting educational attainment is crucial for stimulating economic growth, it can also have adverse effects on employment and wages, particularly in developing nations where the economic framework may face challenges in accommodating a larger influx of graduates [13]. Moreover, the level of education influences various crucial aspects of working conditions, including contract types and working time arrangements. Individuals with higher levels of education are often better positioned to negotiate more favorable employment terms.

However, in labor markets characterized by significant segmentation, where temporary and casual contracts are prevalent while formal permanent contracts are limited, human capital can be exchanged for job security. In such contexts, workers with skills exceeding the requirements of their job are more likely to secure permanent positions rather than temporary ones [14], [15]. Consequently, education can offer a certain level of protection for vulnerable employment situations. Research findings indicate that there is a higher prevalence of young individuals experiencing vulnerable employment conditions among those who have completed only primary education, as opposed to those who have attained higher levels of education [16].

2. Objectives and methodology

The aim and objectives of this research focus on the analysis of the evolution of the relevant indicators regarding the education system (demand and supply of education, the results of the educational system), as well as those related to the labor market (employability, occupational status and income). In particular, it is desired to investigate the correlations and inter-conditions that appear between these indicators in the current macroeconomic context.

3. Statistical analysis on employment

The most analysed dimensions for characterising the labour market situation determined by educational attainment are employability, employment status and earnings. Therefore, a first indicator analysed is the Employment rate of people aged 15 to 74 by education levels. Thus, we can see from the comparison between 2000 and 2021 that there have been a number of changes over the 22 years with regard to the employment of those with a very low level of education (low-skilled workforce). Except for Bulgaria, Hungary, Latvia, Estonia, Malta, and the Netherlands, all other countries experienced a decline in the employment rate of individuals with a low level of education in 2021 compared to previous years. The lowest employment rate among the low-skilled population was observed in Slovakia in both 2000 and 2021. On the other hand, the highest employment rate for this group was recorded in the Netherlands, reaching approximately 50% in 2021, while Portugal had the highest rate of 60% in 2000.

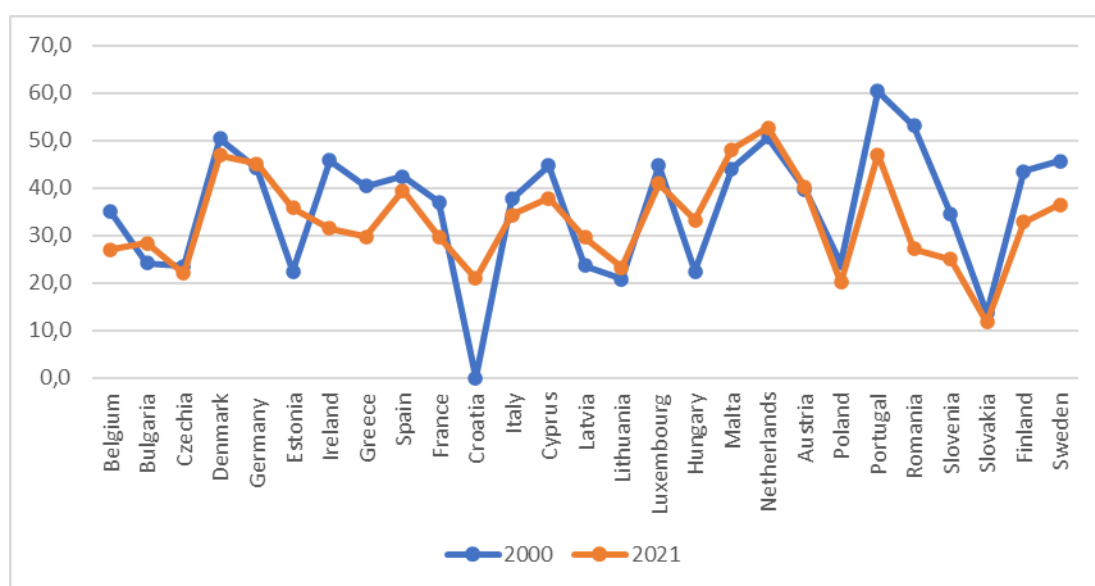


Figure. 1. Employment rate for people with primary and secondary education (ISCED level 0-2), by EU countries

Source: EUROSTAT

When examining the employment rate among individuals with upper secondary or post-secondary education (medium-skilled labor force), it becomes apparent that the employment rate experiences an increase across all countries considered in the analysis, in comparison to those with primary and secondary education. In Denmark, Germany, Estonia, Malta, the Netherlands, and Sweden, approximately two-thirds of individuals who have completed secondary and post-secondary education are employed. However, in the remaining countries, the employment rate for this group ranges from 55% to 67% in 2021. Notably, Greece is an exception with only half of its secondary and post-secondary graduates being employed.

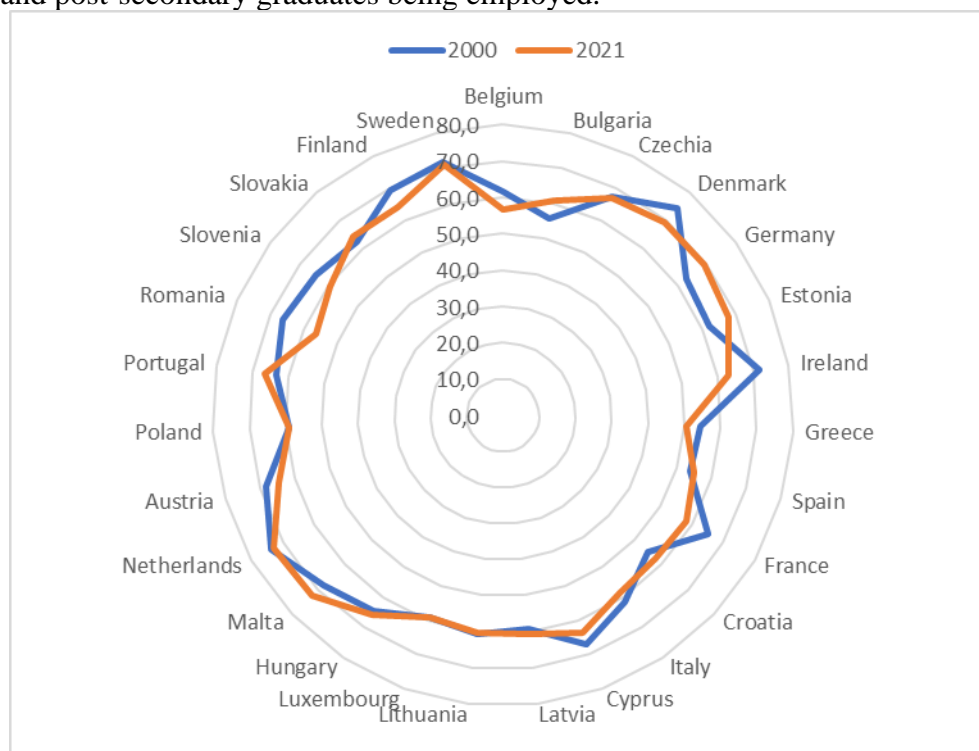


Figure 2. Employment rates among EU countries for individuals with upper secondary and/or post-secondary education (ISCED level 3-4)

Source: EUROSTAT

The data presented in Figure 3 illustrates a notable shift when examining the employment rate of individuals who have completed tertiary education. Across all countries, it is evident that both in 2000 and 2021, more than 70% of graduates in this category are engaged in employment. However, it is worth noting that Greece exhibits the lowest employment rate at 68.8% in 2021, while Malta showcases the highest rate at 87.3%. These findings lead us to the conclusion that attaining higher levels of education significantly enhances the prospects of securing employment in the European countries analyzed.

An additional crucial indicator for assessing risks and vulnerabilities within the education and labor market context is the unemployment rates of individuals aged 15-74, categorized according to their educational attainment levels. It is evident that the highest unemployment rate is observed among individuals with only primary or secondary education, while the lowest unemployment rate is found among those with tertiary education.

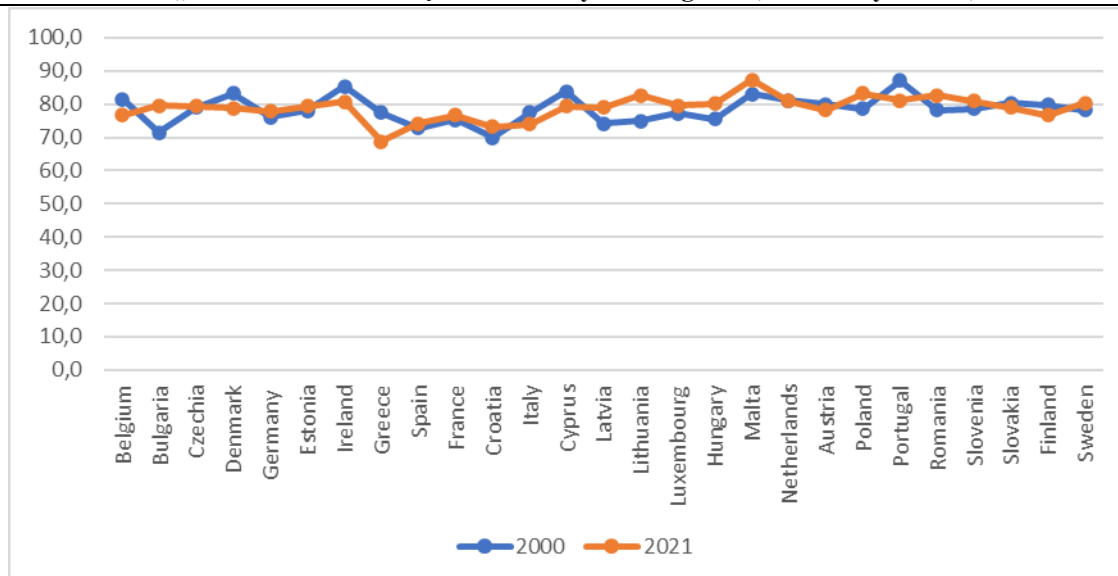


Figure. 3. Employment rates among EU countries for individuals with tertiary education (ISCED level 5-8)
Source: EUROSTAT

The continuing growth of automation and computerisation, together with the relocation of factories to countries outside the EU to take advantage of cheap labour, has led to a reduction in the employability of the low-skilled.

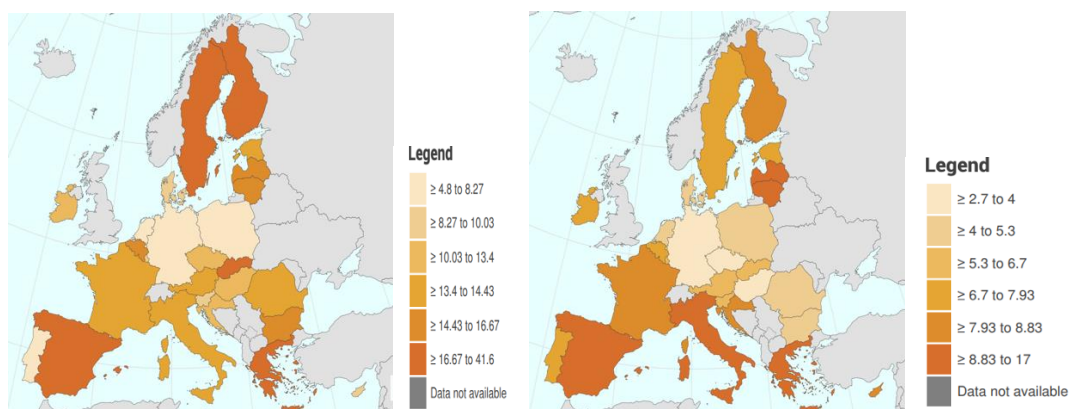


Figure 4. The unemployment rate for individuals who have completed primary and secondary education (level 0-2) in the year 2021
Source: EUROSTAT

Figure 5. The unemployment rate for individuals who have completed upper secondary and/or post-secondary education (level 3-4) at the 2021 level
Source: EUROSTAT

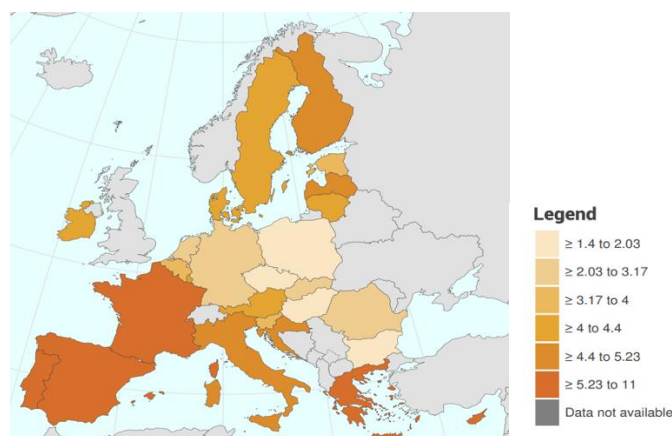


Figure 6. Unemployment rate for population with tertiary education (level 5-8) in 2021
Source: EUROSTAT

The highest unemployment rate for the population with only primary and secondary education is in Slovakia, Spain, Bulgaria and Greece and the lowest in Malta. Those with secondary or post-secondary education have much lower unemployment rates, the highest in Greece at 17%, followed by Spain at 16%, while the lowest is in the Czech Republic at 2.7%. For those with tertiary education, the unemployment rate is much lower in most countries, as can be seen in Figure 6, but countries such as Greece, Spain and Cyprus still have unemployment rates above 6%.

Over the period 2019-2021 The Covid-19 crisis and the resulting fall in economic output have led to major changes in the European labour market, with the most affected being service-oriented sectors such as tourism, trade, aviation and the cultural sector. In response to mitigate the impact of the crisis, all Member States have implemented adaptation measures, such as working time adjustments to reduce working hours and job retention measures and financial support for affected companies. Despite these measures, the labour market situation differed from country to country, with seven countries seeing a reduction in the unemployment rate in 2021 compared to 2019, while in the others the increase ranged from 0.1 percentage points (Belgium, Denmark, Poland, Portugal) to 1.7 and 1.8 percentage points in Estonia and Sweden.

According to statistics, long-term unemployment increased in 2021 for the first time in 7 years, so that 2.868 million women and 2.987 million men aged 15-74 were unemployed for more than 12 months (PES Network, 2022). Although the unemployment rate in 2020 experienced a slight increase of 0.4 percentage points compared to 2019, the average annual unemployment rate in the EU27 for 2021 reached 7%, marking a 0.2 percentage point rise from 2019. Specifically, the unemployment rate for men stood at 6.7%, reflecting a 0.2 percentage point increase compared to 2019, while for women, it reached 7.4%, also showing a 0.2 percentage point increase.

The concept of GDP per person employed provides a comprehensive measure of national economic productivity in relation to the EU average. When a country's index exceeds 100, it signifies that the level of GDP per person employed in that particular country surpasses the EU average, and conversely, if it falls below 100, it indicates a level below the EU average. It measures how efficiently labour is combined with other factors of production and used in the production process.

From Figure 7 we can see that the financial crisis of 2009 and the COVID-19 pandemic interrupted previous trends in labour productivity growth. Although both events had significant effects on the EU economy in terms of GDP and labour force indicators, the effects of the economic crisis were stronger in all countries.

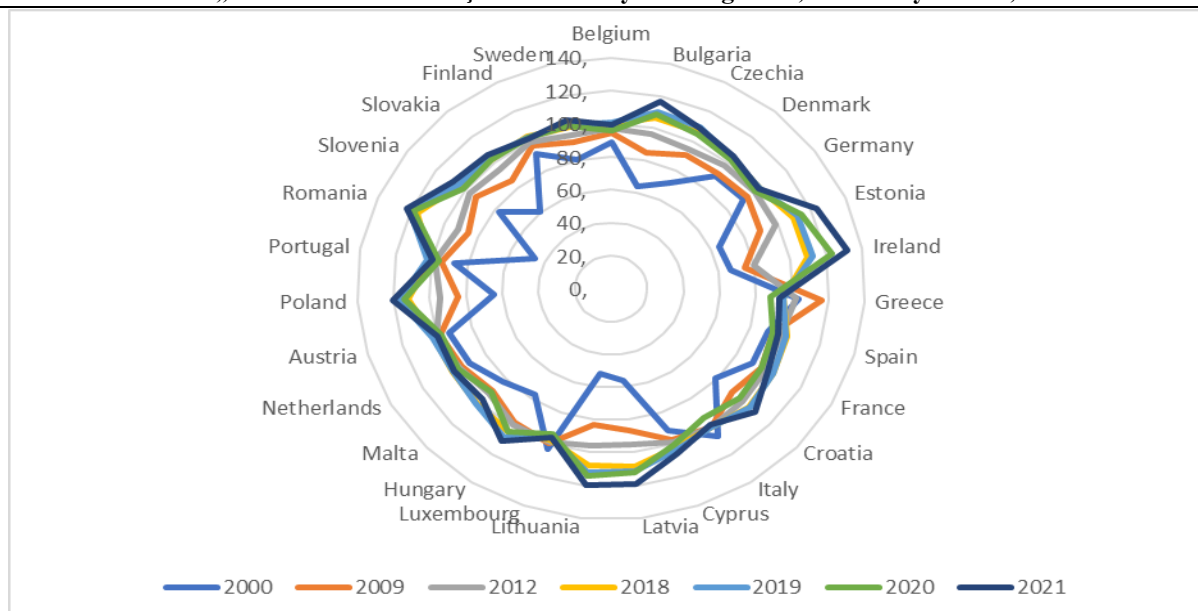


Figure 7. Real labour productivity per person, by EU country
Source: EUROSTAT

In 2020, labour productivity per hour worked continued to increase slightly (+0.6% year-on-year), while labour productivity per person fell sharply (-4.6% year-on-year) (Eurostat, 2022a). In Belgium, Greece, Spain, France, Italy, Luxembourg, Malta, the Netherlands, Austria and Portugal in 2021 real productivity per person is below 100%, which is due to the fact that the fall in hours worked was greater than the fall in GDP, as well as employment per person.

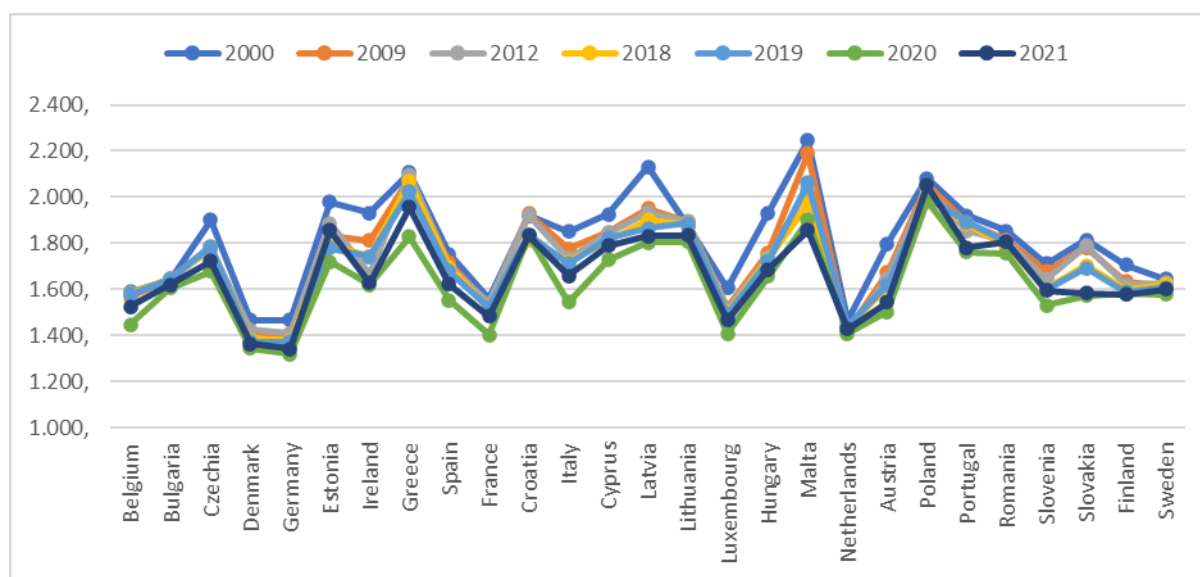


Figure 8. Annual hours worked per person employed, by EU countries
Source: EUROSTAT

As depicted in Figure 8, the countries with the lowest recorded annual hours worked throughout the entire period include Germany, Denmark, France, Luxembourg, and the Netherlands. On the other end of the spectrum, Greece, Latvia, Malta, and Poland consistently had the highest number of annual hours worked, a ranking that has persisted over the 22-year analysis, even during the Covid-19 crisis-induced decline in working hours. Figure 8 further illustrates that in 2020, there was a decline in the number of hours worked across all analyzed countries. However, this trend of reduced annual working hours continued only in Malta and Finland in 2021. Comparing the year 2021 to the starting year of the analyzed period, 2000, it is evident that all countries experienced a decrease in the number of hours worked. Poland exhibited the smallest reduction, with only a decrease of 31.5 hours, while Malta had the most substantial reduction of 388 hours. The ongoing trend of reducing the number of hours worked has been influenced by the increasing adoption of hybrid work models and remote work. Digitization has played a significant role in enabling more efficient work processes, leading to increased productivity within shorter timeframes. As a result, the move towards hybrid work and working from home has further contributed to the overall reduction in working hours.

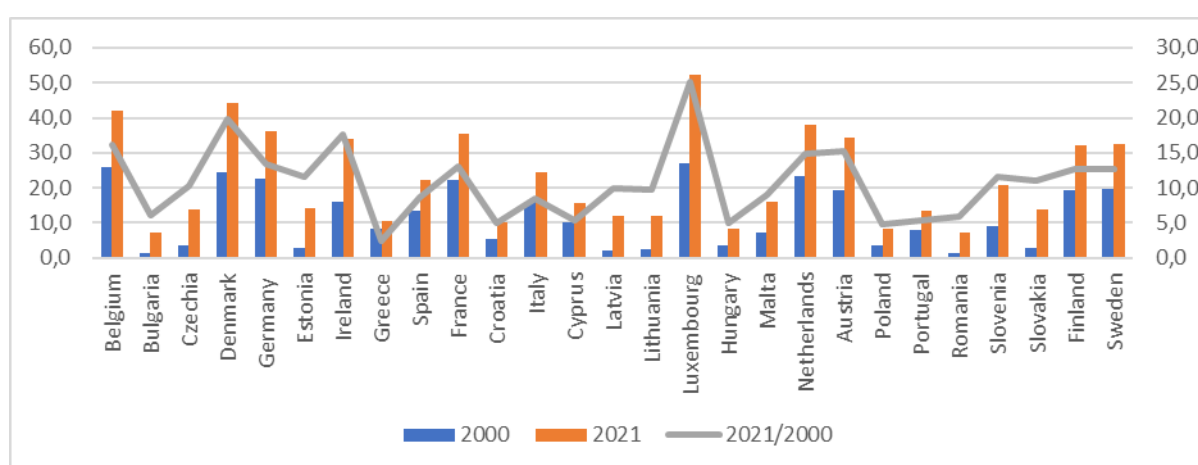


Figure 9. Hourly compensation per person employed, by EU country
Source: EUROSTAT

Another indicator used to assess the changes brought about by education on the labour market and the remuneration of employed persons is the hourly compensation per person employed. In 2000, the average rate of compensation of employees in the European Union (EU), in terms of wages, salaries and employers' social contributions, ranged from EUR 27 per hour worked in Luxembourg to EUR 1.3 per hour in Bulgaria and EUR 1.4 per hour in Romania. In 2021, the highest level of hourly compensation was also in Luxembourg, but reached €52.2 per hour, while the lowest level was €7.3 per hour in Romania and €7.4 per hour in Bulgaria. Comparing the two years, the highest increase was in Luxembourg at €25.2, followed by Denmark at €19.9 and Ireland at €17.7, and the lowest in Greece at just €2.4 per hour.

The most analysed dimensions for characterising the situation on the education market and assessing the implications for the labour market are those relating to the demand for education (participation in education), the characteristics of the supply of education (financial support for tertiary education), the outcomes of the education system (early school leavers, tertiary school leavers, young people not in employment, education or training).

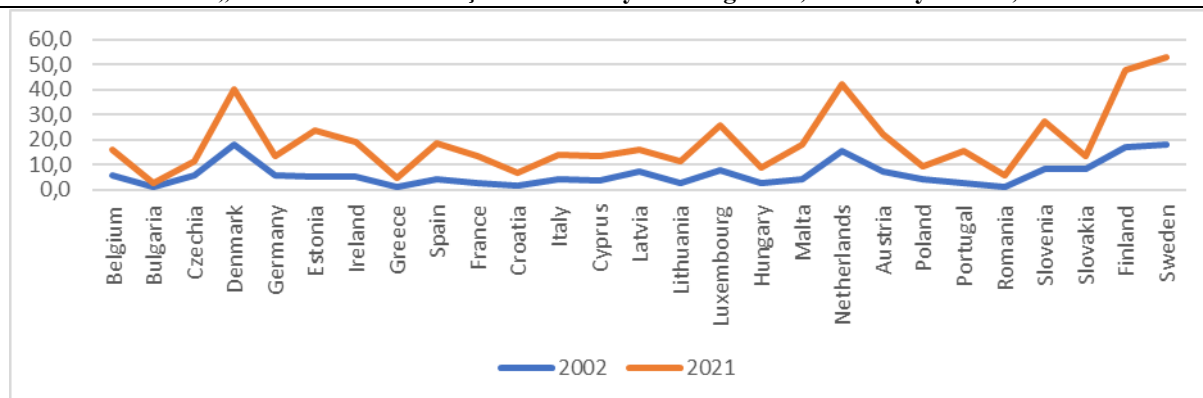


Figure 10. Participation rate in education or training of 25-64 year olds (in the last 4 weeks), by EU countries
Source: EUROSTAT

At the level of national institutions, experts have recognised that adult learning is of utmost importance for workers, firms and economies as it helps to prevent the depreciation of human capital and to maintain or ensure competitiveness in a globalised world. Thus, the provision of adult learning ensures that adults, regardless of their situation: employed or unemployed, maintain and upgrade their skills, acquire the competences needed to succeed in the labour market and strengthen their overall resilience to exogenous shocks, such as the pandemic crisis (OECD, 2021). Ruhose et al. (2019) concluded that adult learning brings them not only employment-related benefits, but also a range of non-economic benefits: personal fulfilment, improved health, social inclusion.

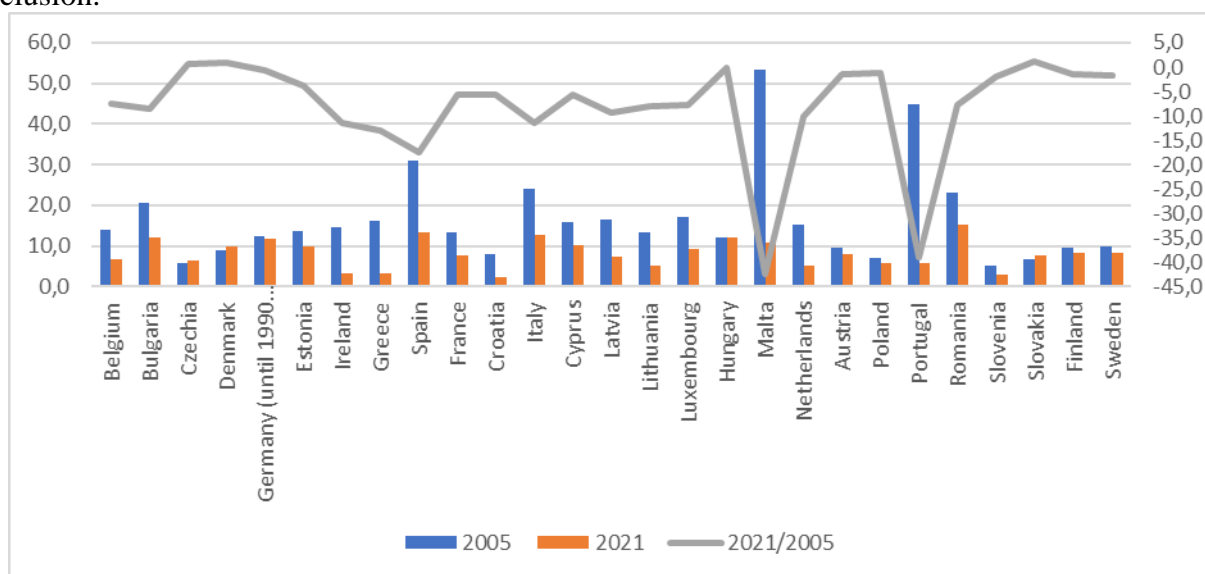


Figure 11. Early leavers from education and training (18-24 year olds), by EU countries
Source: EUROSTAT

Looking at lifelong learning habits, in 2002 the most involved in education and training were adults in Sweden, Denmark, Finland and the Netherlands (over 17% of adults), and the least interested in lifelong learning were those in Romania, Greece and Bulgaria (around 1% of adults). In 2021 interest in lifelong learning is increasing, so that around one third of adults in Sweden have participated in some form of education or training. We can notice an increase in interest in lifelong learning in Romania in 2021 compared to the previous year (4.9% of adults in 2021 compared to 1% in 2020), but still well below other European countries, while adults in Bulgaria are the least interested in education and training (1.8% of adults) which creates obstacles to the development of skills needed in the economy.

In 2021, a significant reduction in the percentage of early school leavers among 18-24 year olds was observed in most countries compared to 2002, except for the Czech Republic and Denmark. Notably, Malta and Portugal experienced substantial decreases in the proportion of early school leavers, with a decline of 42 and 39 percentage points respectively, when compared to the data from 2002. It is worth mentioning that these two countries had the highest percentages of early leavers in 2002, reaching 53% and 40% respectively.

Examining the data for 2021, Romania has the highest percentage of early school leavers at 15%, followed by Spain, Bulgaria, and Italy, which all have significantly higher percentages than the European average of 9.9%. This presents a structural challenge for the education system. In the case of Romania, early school leaving is more prevalent in rural areas, with a rate of 23%, and among disadvantaged groups, including the Roma community. As educational attainment is becoming an increasingly important factor, both in the labour market and for individuals, as well as for society in general, there is a growing interest in tertiary education both among individuals in European countries and among employers. The number of people graduating from tertiary education is expected to increase, along with a growing demand for highly qualified employees corresponding to more flexible and complex jobs. By 2021, only in a few countries the share of tertiary graduates in the 25-34 age group is above 50%, namely Ireland, Cyprus, Lithuania, Luxembourg and the Netherlands, while the EU average is 40.5%. According to statistics from EUROSTAT (2022b), slightly above 41% of the European Union population in the age group of 25-34 holds a tertiary level of education. This indicates that continuous and persistent efforts are required to achieve the target of 45% by the year 2030.

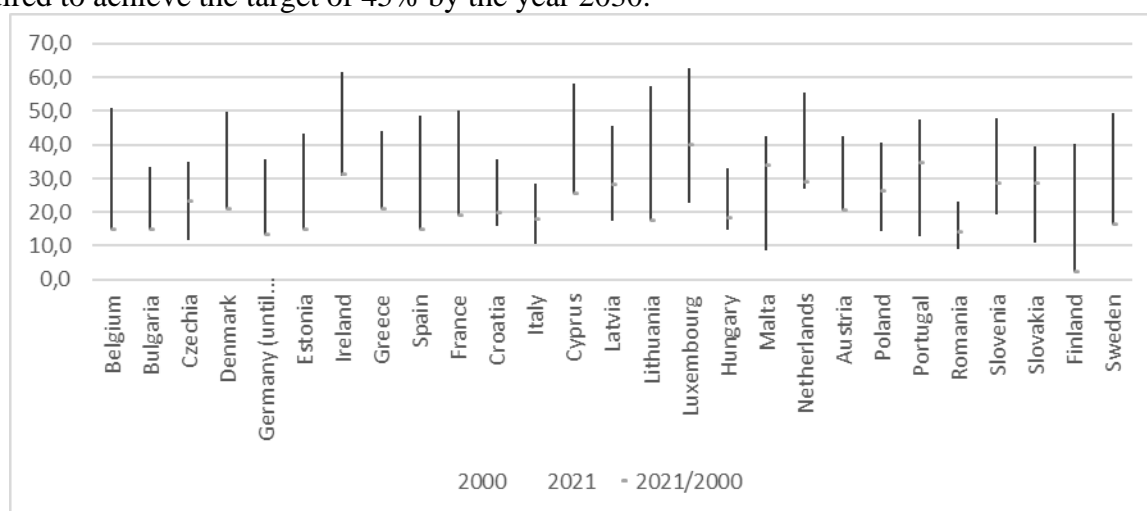


Figure 12. Share of population aged 25-34 having successfully completed tertiary education, by EU country
Source: EUROSTAT

At the bottom of this ranking is Romania with only 25% of the population aged 25-34 with a tertiary education degree. Although the proportion has improved over time, from 9.2% in 2000, reaching Romania's proposed target of 40% by 2030 will require sustained efforts to overcome the main causes of low participation in tertiary education and insufficient numbers of graduates. The main causes identified are the persistently high rates of early school leaving, the low pass rate of the baccalaureate exam [less than half of the age-specific cohort pass this exam (UEFICSCI, 2020), and the low participation of students from disadvantaged backgrounds in tertiary education. An important factor for access to tertiary education is student fees and financial support for students. On the one hand, fees can act to reduce interest in tertiary education because they constitute a financial burden, while various financial support measures can act to reduce the financial burden, increasing interest in tertiary education. Figure 13 shows direct financial support to students as a percentage of total public expenditure on education.

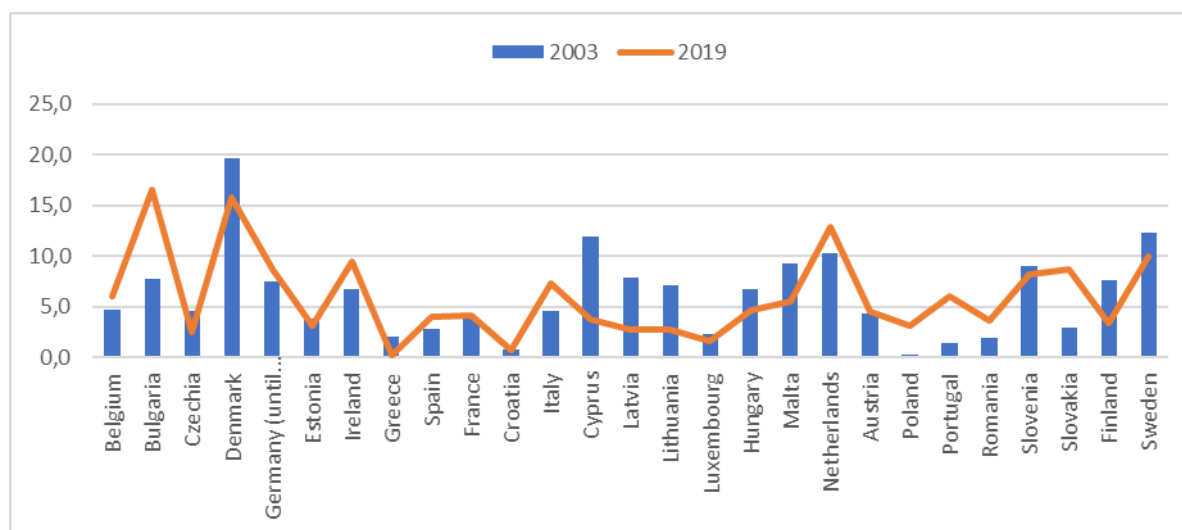


Figure 13. Financial support for pupils and students as a percentage of public expenditure on education, by EU countries

Source: EUROSTAT

In 2019, the share of public expenditure on education used for financial assistance to pupils and students exceeded 15% in Bulgaria or Denmark, was around 13% in the Netherlands, while in the remaining countries it was below 10%. The lowest percentages were in Greece 0.2% and Croatia 0.8%. Almost all EU Member States provide at least one type of direct financial support (a grant or a loan) to tertiary students. In some Member States, there are both grants and loans; as such, students may have to apply through separate procedures to receive one or both forms of aid. Of the countries surveyed, in the Netherlands and Sweden student loans have a higher share than grants, and in 19 countries student loans either do not exist or represent a very small share of total financial aid (less than 1.0%) (Eurostat, 2022c).

By educational attainment, the most economically active were people aged 15-64 with tertiary education (short and long university degrees, including masters, doctorate, postdoctorate and postgraduate studies), their activity rate being around 80% in almost all countries in 2000, except Hungary and Luxembourg. People with a medium level of education (post-secondary specialist, secondary school, including first stage and vocational, complementary or apprenticeship) were more than 65% active in the labour market in all countries.

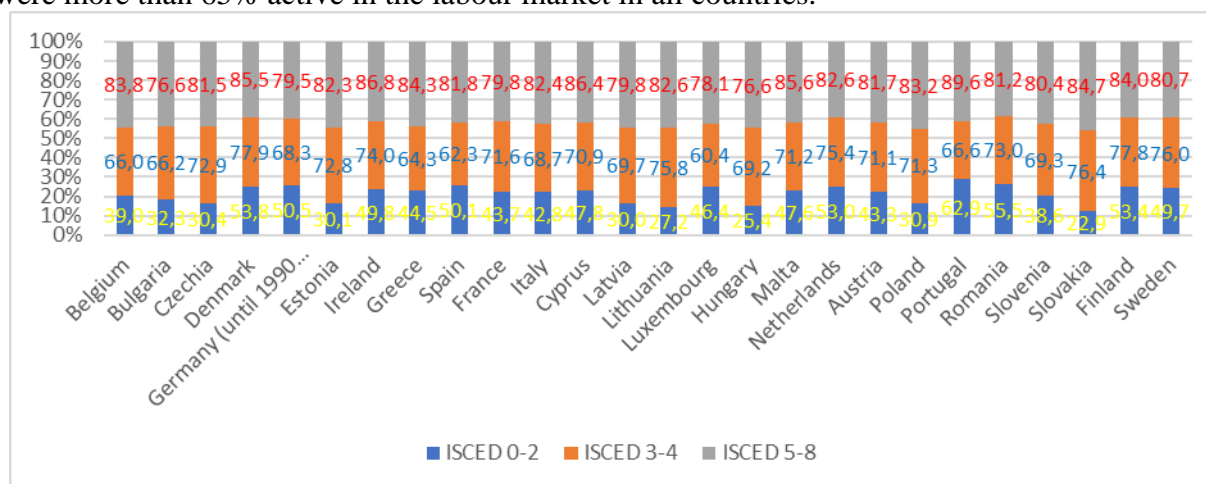


Figure 14. Activity rate by education level in 2000, by EU country

Source: EUROSTAT

Participation in economic activity of people with low levels of education (secondary, primary and out-of-school) differed widely across countries. Thus in Portugal the activity rate was 62.9% , 55% in Romania , 53% in Finland Denmark and the Netherlands, but also low activity levels in Slovakia 22.9%, Hungary 25.4%. In 2021, we observe an increasing trend in the labour force participation of highly educated people in almost all countries except Finland, Slovakia, Portugal, Greece, Ireland, Denmark, Belgium, while the activity rate of medium educated people has decreased significantly in 2021 compared to 2000, except for Malta, Portugal, Germany, Spain.

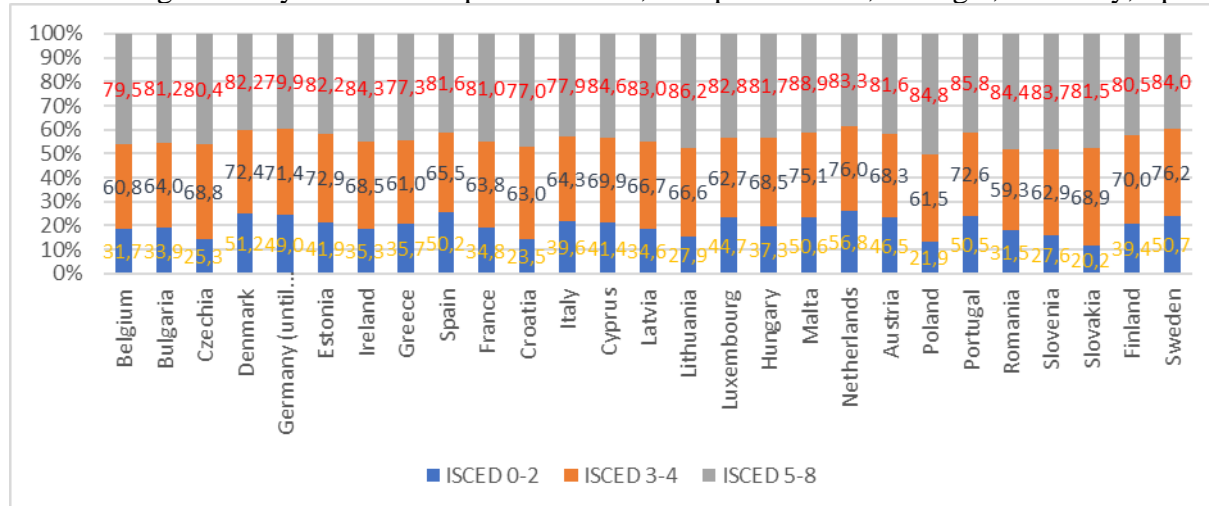


Figure 15. Activity rate by education level in 2021, by EU countries
Source: EUROSTAT

The activity rate of the low educated shows a surprising increase in Hungary (by 11.9% to 37.3%) and Estonia (by 11.8% to 41.9%) and a major decrease in Romania (by 24% to 31.5%), Finland (by 14% to 39.4) and Ireland (by 14.5% to 35.3%).

Such an analysis of changes in the educational structure of the population and differences in activity rates by education level was carried out by Loichinger and Prskawetz (2017) and showed that changes in participation rates of those with non-university education contributed considerably more to the observed increases in participation than did participation rates of those with tertiary education. However, the authors believe that in the future, the college-educated will continue to displace older people with lower levels of education, generating a positive education effect.

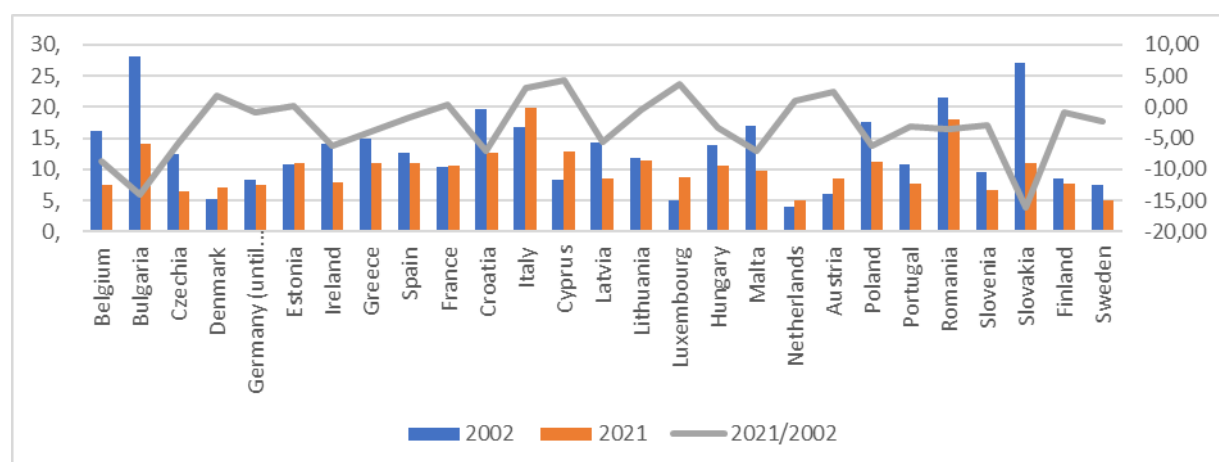


Figure 16. NEETS (Percentage of young people not in employment, education or training out of the total population in the same age group (15-24 years)), by EU countries

Source: EUROSTAT

The reduction of NEET (Not in Employment, Education, or Training) rates in the 15-24 age group is an important target for the European Union (EU) to achieve by 2030. In 2021, there were significant variations in NEET rates among EU member states for this age group. Several countries, including Belgium, the Czech Republic, Germany, Ireland, Latvia, the Netherlands, Austria, Sweden, Slovenia, Portugal, Finland, Denmark, and Luxembourg, had already achieved or surpassed the EU's long-term target of 9.0% in 2021 or earlier.

On the other hand, there were fourteen member states with NEET rates above the target. Italy and Romania had the highest rates, with more than 19% of young people aged 15-24 classified as NEET. A comparison between these two countries and the Netherlands and Sweden revealed that Italy's NEET rate was four times higher than that of the Netherlands and Sweden in 2021.

Among EU member states, Slovakia saw the largest reduction in NEET rates between 2002 and 2021, with a decrease of 16.1 percentage points. This was followed by Bulgaria (-14.1 pp.) and Belgium (-8.7 pp.). However, eight member states experienced increases in their NEET rates during the same period, with Cyprus (+4.4 pp.) and Luxembourg (+3.7 pp.) showing the highest increases. Italy also had a significant increase of 3 percentage points, while Austria, Denmark, the Netherlands, France, and Estonia saw smaller increases ranging from 0.2 to 2.4 percentage points.

An important aspect of the education-labour market relationship is the transition from education to work, i.e. the situation young people find themselves in both during and immediately after their studies. Today's young people tend to work during their studies, more in Western countries and less in Eastern European countries, work part-time or seasonally, and change jobs very often. Another trend observed is for those in employment to return to education or training to acquire new qualifications. All this makes the transition from education to work distorted by the high proportion of students working and the large number of employees (in many cases adults) studying or training.

4. Conclusions

Regarding the situation on the labor market in relation to the level of education, employability, occupational status and income are the most frequently analyzed dimensions. With the exception of Bulgaria, Hungary, Latvia, Estonia, Malta and the Netherlands, in all other countries we see a decrease in the rate of employed people with a low level of education in 2021.

In many countries, such as Denmark, Germany, Estonia, Malta, the Netherlands and Sweden, about two-thirds of high school or post-secondary graduates are employed, while in the other countries the percentage varies between 55% and 67% in the year 2021. The only exception is Greece, where only half of high school and post-secondary graduates are employed.

The situation changes when we analyze the employment rate of people with tertiary education, because we notice that in all countries, both in the year 2000 and in the year 2021, more than 70% of graduates are employed. However, Greece has the lowest level of occupancy at just 68.8% in 2021, while Malta has the highest at 87.3%.

In 2019-2021, the Covid-19 crisis and the resulting economic downturn have generated significant changes in the labor market in Europe, particularly affecting service-oriented sectors such as tourism, trade, aviation and the cultural sector. The unemployment rate reached the highest level among the population with primary or secondary education, while it was lower among those with tertiary education. Ever-increasing automation and digitalisation, together with the relocation of some factories to countries outside the European Union for cheaper labour, have reduced employment opportunities for the low-skilled.

Labor productivity per person measures the degree of efficiency with which labor is combined with other factors of production in the production process. The financial crisis of 2009 and the COVID-19 pandemic interrupted previous trends in labor productivity growth.

Although both events had significant effects on the economy of the European Union in terms of GDP and labor force indicators, the economic crisis had a stronger impact in all countries. An increase in the number of higher education graduates is forecast, in parallel with a growing demand for highly skilled employees suitable for more flexible and complex jobs. In 2021, a limited number of countries, namely Ireland, Cyprus, Lithuania, Luxembourg, and the Netherlands, reported a population aged 25-34 with a tertiary education attainment exceeding 50%. Statistics reveal that slightly over 41% of the European Union population within the 25-34 age group possesses a tertiary level of education. Consequently, concerted and persistent endeavors are necessary to achieve the target of 45% by 2030. Romania occupies the bottom position in the ranking, with only 25% of the population aged between 25 and 34 having obtained a tertiary education degree. An important factor in access to tertiary education is the fees charged to students and the financial support given to them. On the one hand, fees can discourage interest in tertiary education because they represent a financial burden, while various financial assistance measures can reduce this burden, stimulating interest in tertiary education. In 2019, the public expenditure allocated to education for the financial assistance of pupils and students exceeded 15% in Bulgaria and Denmark, about 13% in the Netherlands, while in the other states it represented less than 10%. The lowest percentages were recorded in Greece (0.2%) and Croatia (0.8%).

In the year 2021, we observe an increasing trend in the participation in the economic activity of people with a high level of education in almost all countries. It is predicted that in the future, people with higher education will continue to replace older people with lower levels of education, which will have a positive effect on education.

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