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Analyses of the German, Greek, Hungarian and Swedish labor market between 2017 and 2021 based on age, gender and educational level

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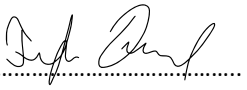

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1. INTRODUCTION

The labor market is a pivotal component of an economy, serving as a gauge of its general welfare and potential for growth. Consequently, examining labor market dynamics can provide valuable indications on economic conditions and social patterns in society. The period spanning from 2017 to 2021 presented a noteworthy labor market scenario as several significant economic and social factors influenced the trends in employment and job prospects. Primarily, this phase was characterized by the residual impact of the global financial crisis that continued to affect numerous economies worldwide, particularly those situated within Europe. Subsequently, many countries' labor markets experienced elevated levels of unemployment rates - especially amongst younger demographics - alongside sluggish job growth.

During this time, there was a swift progression in technology, automation and digitization. These advancements had a substantial impact on the labor market as they altered its landscape significantly. Employers sought individuals with technical skills and knowledge pertaining to fields such as data analysis, artificial intelligence, and machine learning leading to an increase in demand for these skills. Consequently, there emerged a discrepancy between workers' abilities and the skill set required for new job openings resulting in a widening skills gap.

The labor market situation during the period was also affected by demographic changes. Low birth rates and an aging population led to a reduction in the workforce in some countries, whereas other nations saw job market dynamics impacted by an influx of immigrants. Additionally, there was a significant disturbance caused by the COVID-19 pandemic that resulted in reduced working hours, widespread unemployment, and business closures worldwide.

This thesis focuses on the analysis of four European nations namely Germany, Greece, Hungary, and Sweden with respect to how their respective labor markets have progressed between 2017-2021. Specifically scrutinizing outcomes among varying demographic groups such as age brackets, gender ratios or educational levels shall offer insights into similarities/differences amid each country's experience within this context while also supporting policymaking decisions by using my findings. In summing up my research may help clarify intricacies inherent within Europe's labor markets whilst helping advocate more comprehensive policies that cater towards everyone across all echelons of society.

2. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1. Demographic challenges for labor market adjustment

Addressing demographic challenges is inherently important for the sustainable growth of Europe, economically, culturally, and politically. Boden, M. (2010) argues that interventions should not only focus on the demographic problems of the present, but that progressive planning requires better anticipation of future processes and challenges in order to prepare effective policy and public policy responses in time. It is necessary for the harmonization and cooperation of legislation in the EU Member States in order to provide a common response to the two main challenges (ageing society and migration). To this end, the European Commission adopted five policy guidelines in 2006 with the direct or indirect aim of achieving labor market stability and reducing vulnerability to recession. (1) Ensuring a balance between professional, private and working life, (2) stimulating employment by increasing the number of jobs and working longer, by promoting alternative work opportunities and work patterns, (3) a more productive and dynamic Europe, (4) the legally regulated reception and integration of immigrants from outside the EU, taking into account real labor market needs, and (5) the consolidation of intergenerational social security and equality through the implementation of sustainable Community funding.

Ageing and the rapid decline in the birth rate, which is a feature of economically strong regions, especially in the North Atlantic, mean that 60% of the world's population now lives in countries with stagnating or declining labor forces, especially in highly industrialized macro-regions such as the European Union. The average life expectancy at birth of the population of the 'old continent' will increase from 82.4 years today to 85-90 years for women and from 76.6 years to 80-85 years for men by 2030, with more than 50% of the EU population aged over 50 (Harper, s. 2010). For every four citizens of working age, there will be three pensioners, which could lead to a complete overhaul of the EU pension system and the chains of redistribution, so that efforts should be made to legislate for a labor market tailored to the 50-70 age group. On the other hand, the number of births will continue to stagnate at the present extremely low level (1.5 children per woman), the reason being the second demographic transition (Van De Kaa, D.J. 1987). For the generation born in the new millennium, a few career changes during their active years, a career path stalled, a career path diverted, is a natural process. Active working lives in the present and in the future in the same workplace, in similar jobs, will be replaced by jobs with periodically changing and different structures and profiles. This includes the

development of skills, abilities, expertise, and work experience, giving workers greater individual freedom of response and flexibility to either ride the career wave or temporarily slow down the workload over an increasingly longer period of time.

2.2. Technological challenges

In the capitalist macro-economies of the early 21st century, three industrial revolutions could be distinguished, the first symbolized by the advent of steam engines, the second by the emergence of assembly lines in the context of Taylorism, and the third by automation. A structurally new and challenging industrial revolution is now underway, the main feature of which is the networking of physical machines and objects, the integration of the real economy into a single, vast, intelligent information system, and the complete digitalization of industrial processes (Schway, n. 2016). But it is not just about the conquest of technology, it is also about a paradigm shift in business processes (Simon J. 2014). the new world will place different demands on the workers of the future, with the World economic forum predicting that 5 million jobs could be lost worldwide by 2020 - although 2.1 million new jobs will be created at the same time, the balance is still negative. Of course, the jobs lost, and the jobs created do not require the same skills and abilities, so countries' education policies have a huge responsibility to train and/or retrain the competitive workforce of the future in time.

Change requires the acquisition and then practical application of the skills required of future employees, which can only be achieved through continuous improvement of the education system and its adaptation to the level of technological development (Bowles, J. 2014). Among the main changes that can be expected in the near future are: closer interconnection of software modules, rapid response to new trends and customer needs, lower capital and working capital requirements, lower inventory levels, low space requirements, minimal semi-finished products, efficiency and transparency in data structures and processes, efficient machines, processes and software production, and finally, an increase in productivity of around 30% (Borgia, E. 2014). As a result of the technological revolution, firms in the 21st century face stronger global competition and shorter business cycles, and fewer and fewer firms are free from longer or shorter periods of disruption. Technological advances, such as programmability, artificial intelligence and automation facilitated by robotics, will affect 54% of the workforce in OECD economies in the next decade or two (the proportion varies between 40 and 60%) (Frey, C.B.-Osborne, M.A, 2013). It is important to emphasize that the aim is not to replace entire occupations, but rather tasks and activities, so the expected rapid adaptation of workloads and the creation of new work processes and tasks based on modern technology may sometimes

exaggerate the alarming labor market effects (Schumpeter, J. 1980; Arntz, M. - Gregory, t. 2014). in contrast, the future is ominous in terms of deepening inequalities due to technological change and adaptation delays in the training/retraining system (Bowles, j. 2014). The countries most at risk of technological unemployment are the US, Germany and Mediterranean countries (e.g. Spain), where 12-13% of jobs are 'at risk', while the workforce in northern and eastern European countries is least affected by modernization. There are profound academic debates in the economics community about the macroeconomic implications of "techno civilization" for future economic growth.

According to the increasingly unpopular minimalist approach, the pace of economic growth will slow in the near future, and technological developments will not be able to stimulate it (Gordon, R. J. 2012). in stark contrast to the previous view, the maximalist narrative (Frey, C.B.-Osborne, M.A, 2013; Brynjolfsson, E. - MCafee, a. 2014) predicts dramatic economic change. According to their thesis, education and technology are in a spiral struggle with each other in the competition for employment. In this context, the workforce will need fundamentally new skills, and the automation of work processes will affect not only routine activities but also the performance of cognitive tasks: first low-skill and low-wage activities, then more complex computerizable tertiary sectors will fall 'victim' to automation (autor, d. H. - LEvy, f. - MurnanE, r.j. 2003). at present, most jobs in OECD countries are automated - with widening regional differences influenced by workplace organization, prior technology-intensive investment and the level of education. The process is defined by schumpeter, j. (1980) as creative destruction, i.e. something is destroyed and replaced by something else. The new combinations are usually embodied in new firms, which operate in parallel with the old ones, compete with them (even eliminate them from competition), absorb their resources, take over their leading role.

This kind of innovation means a rise for companies, families and individuals, and a fall for others. Creative destruction" is an important factor in setting a new development path, and it is therefore necessary to create the conditions and institutional arrangements that enable it to flourish (Abernathy, w. - Clark, k. 1985). At the same time, the great transformation processes, the transformation of investment, labor, institutions, the displacement of the old and the emergence of the new, take the form of concrete events, happenings, managerial, investor and individual decisions. Ormerod, p. (2015), in his evolutionary economics approach, describes these failures and degradation as a natural consequence of natural selection at work. Two types of creative destruction are distinguished. The first type of destruction (within the sector) is

exemplified by the rise of mobile telephony over fixed telephony. The second type is illustrated by the changes in the structure of the workforce and the disappearance of certain professions as a result of computerization, and the way in which complex yet efficiently algorithmic tasks are being taken over from people by computers (Levy, f.-Murnane, R.J. 2004). As the number of tasks involving expert thinking and complex communication decreases, the proportion of routine manual and cognitive work, as well as non-routine manual work, increases (Levy, f.-Murnane R.J. 2004). With their re-engineering programs, telecommunications companies are at the forefront of innovating processes and service delivery methods.

Given the rapid pace of development and expansion in a liberalized market, the opening up of new markets is a constant challenge, whether they be new demographic segments (young people, the elderly) or new geographical areas (Asia, Africa) (Sabó k. 2006; Bögel Gy. 2008). Production, customer service and a range of other activities are being outsourced in many places, cheaper sources of supply are being sought, and supply chains are being built that span the globe. These global value chains allow firms and economies to do the part of the process in which they are most efficient. Because they use intermediate goods and services produced elsewhere, they do not need to build an entire industry. This kind of outsourcing and offshoring of jobs increases competition between firms. capacity by providing access to cheaper, more differentiated and higher quality inputs. The increasing interconnectedness and interdependence between economies offers a wealth of opportunities, but also political challenges for the future. (Porter, M. 1985; Arndt, S.K. 2001; Amador, J. - Cabral, s. 2014)

2.3. Significant atypical forms of employment after the economic crisis

During the eighties and nineties, employment underwent turbulent changes, and a flexible but highly precarious labor market with a triple structure gradually emerged (Peckk j. 1996). The broadest group of the labor market is the primary (open) labor force (the number of people employed excluding expatriates and those in public employment), where employment is continuous and full-time, but this view has now become a generalization and simplification. The second group, the secondary labor force, is made up of the primary peripheral group, where the number of workers fluctuates intensively but the conditions of employment are similar to those of the primary group (albeit with lower efficiency), and also includes part-time workers on short-term fixed-term contracts (Hárs Á. 2010; Nagy g. 2010).

The secondary labor market has a higher rate of job changes than the primary one, and can essentially be regarded as a reserve labor stock for the primary sector. Secondary workers are in a significantly more disadvantaged position in terms of job and employment

opportunities. If there is an imbalance or a market slack, some of the workers in the secondary labor market, especially those with above average human capital, will move to the primary sector. There is a tertiary segment of the labor market, made up of the self-employed, subcontracted workers, employees in outsourced activities and seasonal workers. They are characterized by frequent insecurity about income, livelihoods and contractual conditions (Molnár gy.-Bakó t.-Cseres-Grrgely Zs.-Kálmán j.-Szabó T. 2014; Nagy G. 2010). The recent crisis in the global economy has increased the importance of the tertiary labor market (mainly as a temporary living strategy due to necessity) and has also intensified exchanges and flows between primary and secondary labor markets. A series of professional debates have been launched on the transformation of the labor market, on the increasing proportion of workers with close and looser ties to the labor market, on the inflexibility and difficulties of adaptation of permanent employment, on flexible working hours (less than 35 hours per week), on part-time work (Kazuya, p. 2005; Hárs á. 2010).

Rodgers, G. - Rodgers, J. (1989), Frey M. (2010) and the International Labor Organization (ILO) definitions of flexible (atypical) work include the following forms of work:

- Part-time employees, whose normal working hours are shorter than those of employees with similar qualifications and practical experience in the same type of job, contract or employment relationship and similar job function in the same workplace. The Hungarian labor market is the most flexible of all EU countries, with a fixed working time rate of 90%, compared to only 70% in the Netherlands (Hungarian Telework Association, 2013).

Temporary employees, who do not have a continuous employment relationship, work intermittently with small to large interruptions. This group includes, above all, employees with a fixed-term contract, who are usually monitored in European statistics. Seasonal and casual work also constitute temporary employment.

- Temporary agency work is a tripartite employment relationship where the worker is employed on a with a temporary employment agency for the actual work takes place with a third party, the borrower.

- The specificity of home working and teleworking is that the work is carried out by the employer away from the employer's premises.

- Flexible working time is a different working schedule, work organization an atypical element within the traditional employment relationship, which, through a more flexible organisation of work, loosens the constraints on the use and scheduling of working time.

- Night and weekend shift work, the so-called 'antisocial work pattern', implies permanent or occasional evening, night or weekend work.

- Self-employment is work that is performed on a contract basis and, more importantly, in an atypical way. According to this definition, self-employed persons are the working owners of sole proprietorships and partnerships, whether or not they have employees. Encore careers and phased retirement are common in Western and Northern Europe and have recently started to gain ground in the post-socialist region. The former is a second-stage job, characterized by steadily increasing income, greater personal influence and social impact. It is usually found in prestigious, paid positions in the public sector, primarily in education, government, health, social services and the environment (Freedman, M. 2007). The latter is characterized by workers close to retirement age who consciously make a steady transition from full employment to full retirement. It can take different forms: a gradual reduction in hours/days for pre-retirement, part-time, seasonal or temporary work after retirement, and job-sharing. It is particularly useful for workers who do not wish to leave the workforce overnight, and is also financially beneficial for the employer, as it does not have to cover the training of the younger employee and the costs of the new workforce.

According to relevant Eurostat data, employment is higher in countries where part-time work is more widespread. Employment incentive programs have been launched to increase labor market activity and to increase atypical forms of employment for groups that are difficult to attract into the labor market. Part-time jobs are partly explained by the increase in supply-side reasons, i.e. the need to balance work and leisure, private life and family life, rather than being an option accepted because of lack of job opportunities. Its boom in the 1980s and 1990s was due in particular to the generalization of female employment, which accounted for half of the increase in part-time work. However, the likelihood of choosing alternative employment depends to a large extent on the family situation, the individual's labor market history and the customs of the country concerned. (Buddelmeyer, H.-Mourre, g.-ward, M. 2005) the spread of flexible working has been led by the development of communication and information technology systems, which have made it easier for employers to specialize production, recruit

temporary labor quickly and rely increasingly on external suppliers (LEE, D.R. 1996; Cappelli, p. et al. 1997).

According to the 2017 report of the Hungarian Central Statistical Office (KSH), on the one hand, some of the jobs that were thought to be secure have disappeared, which has resulted in a global increase in unemployment, and on the other hand, the share of full-time employees has also decreased. In the course of both processes, the prestige and social status of certain occupations have gradually changed, thus sectors and unconventional jobs have become potential opportunities that the respective employee would not have considered or taken up before. In addition, the labor market share of part-time and seasonal employment has increased. The increase in demand has allowed the proportion of people working flexible hours to rise, while the contraction in supply has increased the value of previously lower status jobs as a potential route to work.

2.4. Unpaid (alternative) activities - domestic work

One important group of unpaid activities at home is housework (e.g. cleaning, cooking, gardening). Measuring this activity as part of GDP is an important way of measuring the self-esteem of women and men who stay at home to raise children and do housework. respect for themselves and their families and would also provide a more accurate picture of GDP and economic growth, as well as leading to public policy changes in the allocation of time spent on housework and paid employment. The KSH measures the time spent on domestic work and the wage that can be assigned to it, which gives the household satellite account, so that the value can be compared with national accounts (KSH, 2016). even in the egalitarian states of northern Europe, 70% of the essential tasks listed are performed by women.

Feminist approaches argue that integrating domestic work into GDP can increase women's awareness and empowerment in more traditional male-dominated societies. As women's participation in the labor market has increased over the past decades, the amount of unpaid housework women does has decreased in proportion. Nevertheless, the GDP, which has grown intensively over this period, overlooks the serious decline in the amount of time spent working in the home. Based on opportunity cost calculations and the market substitution approach, home-based work accounts on average for 30% of the EU's GDP, but there are visible regional differences. While the share is 9.9% in Latvia, it is 42% in Germany and 20.8% in Hungary (Gianna, C. et al. 2010). the significant share is also reflected at the global level, as the Human Development Report measures that household 'production' accounts for 40% of global economic output. country studies also show that economic progress in terms of wages does not

reduce the amount of time spent on unpaid work at home, but that cultural traditions are more important. In countries with higher average earnings, significantly more time is devoted to unpaid activities - especially childcare and eldercare, which are seen as valuable activities similar to leisure. Gianna, C. and colleagues (2010) argue that work at home is important not only because its quantitative measurement provides a means of comparing it with other social activities, but also because it should have a monetary value for three reasons. First, knowing the value of unpaid work at home makes it easy to compare it with market activities. Secondly, it provides a basis for demonstrating women's realistic contributions to national GDP and gender inequalities. Finally, it contributes to the choice of an appropriate strategy for family support schemes implemented on the market, by the state or privately through the family. As described above, ignoring housework distorts the objective measure of economic growth (Swiebel, J. 1999; Anxo, d. et al. 2007) and it is therefore advisable to take it into account in the future.

2.5. Public employment as an economic policy response

The economic changes of the last decade have confirmed the emergence of a new world economic era, characterized mainly by contrasting social, economic, cultural and political traits (poor-rich, developed-developing, Christian-Islamic, North-South, USA-China), to which the individual national economies have had to respond. One of the traditional ways of dealing with the high unemployment resulting from the economic crisis is public employment (KSH, 2017). even during the Great Depression of 1929, such government programs were launched worldwide (e.g. USA - New Deal), with the main aim of creating a large number of new jobs (Koós B. 2016).

One possible response to the global economic crisis, which has been introduced by many countries (including Hungary), is the employment-related policy trend of the "work-fare society" model. The term was introduced in 1968 by James Charles Evers and became popular after a 1969 television speech by US president Richard Nixon (LEE, d. 2015). The model aims to transform the traditional welfare policy, and to do so in a way that the beneficiaries of public welfare benefits must meet certain participation requirements (Szolnoki Sz. 2012). in Hungary, the public employment system was reformed in 2011, based on the principle of "work instead of welfare", in order to create a socially useful, value-creating form of employment (Koós B. 2016). the participants were placed in a specific public employment scheme, where the public worker had to meet various conditions to continue receiving benefits (Kálmán J. 2015). on the other hand, they were entitled to social security benefits and paid leave but were paid less than

the guaranteed minimum wage. This form of employment represents a transitional situation between unemployment and employment in the primary labor market (koós B. 2016).

Today, public employment is already in practice in many other countries (Australia, the Netherlands, the UK, the USA, etc.) and is part of the labor market process and of the transformation of the social system, but it is still fraught with uncertainties. The three most important questions are: what type of job opportunities (e.g. linked to which economic sector) are being discussed, the actual number of people in public employment, and most importantly, how many people are transferred from public employment to the primary, open labor market (Molnár Gy. - Bakó T. - Cseres-Gergely zs. - Kálmán j.-Szabó t. 2014). Public employment is used in both developed and developing countries, albeit under different conditions and with different objectives and instruments. Common features are that it provides short-term employment opportunities for the unemployed and reduces poverty through income transfer (Koós B. 2016). The sectoral distribution also varies accordingly, while in economically developed countries, for example, the aim is to improve employment (e.g. in municipalities, the public works program is largely concentrated in agriculture, as in Hungary, Argentina and the Netherlands), in less developed regions, the aim is to develop the territory (e.g. India and Morocco). In some countries, the development of social services is also an objective, such as care for the elderly in Argentina. Often, however, these forms are mixed (in India or Argentina, direct agricultural production is used alongside investment-type agro-public employment projects) (Koós B. 2016). Public work program also takes different forms, with seasonal programs (e.g. in Morocco, for a limited period of time each year) and those that are not (e.g. in the case of the Netherlands, for a limited period of time each year). India), government employment programs (e.g. USA, Hungary), short-term employment programs following natural disasters (e.g. Africa, South Asia), and explicitly live-labor intensive programs (e.g. Senegal, World Bank-funded programs) (Kalmán j. 2015).

The share of people in public employment is shown by the expenditure on direct job creation in addition to the actual number of people, which can vary greatly from country to country as a share of GDP. Looking at Europe as a whole, Hungary, Ireland, Bulgaria and France spent the most on direct public employment programs in 2012. Expenditure subsequently decreased in only three countries: Bulgaria, Latvia and Hungary. The proportion of participants involved in direct job creation varies between countries, with the highest rates (above 5% per 100 jobseekers between 2006 and 2012) in Slovakia, Bulgaria, Luxembourg, France, Ireland and Hungary. In most countries, the share of people in public employment has

already decreased during the crisis (responding instead with other labor market interventions), for example in France, Luxembourg and Ireland.

The most important evaluation of public work programs is to look at how many people move from public employment to the primary open labor market. Studies have shown (Gy. Molnár - T. Bakó - J. Cseres-Gergely - J. Kalmán - T. SaBó 2014), using Hungary as an example, that prolonged participation in public employment has negative effects on future employment, and that simply doing the job is negatively related to job chances. Approximately one in ten people in public work programs succeed in finding a job in the primary labor market after leaving public employment (KSH, 2017).

The success of public employment and public work programs is significantly influenced by timing, setting the right wage levels, motivating participants and the quality of the work done. As public work programs are often decentralized, local authorities have a key responsibility for their success, both in selecting projects and participants (Kálmán J. 2015).

2.6. Background to the 2008 and 2020 crisis

The background to the two crises can be presented in different depths because of their temporality. The global economic crisis of 2008 has already ended and has been the subject of much research and study (e.g. Kocziszky et al. 2018). The crisis that started in 2020 is still ongoing and it is impossible to predict when it will end. There are also differences in the underlying causes, which may require different responses.

The crisis of 2008, starting from the US credit crisis, became first a global financial crisis and then an economic crisis (Delbianco et al. 2019). The prominent economic role of the US and the economic interconnections caused by globalization have allowed the recession to reach the whole world with a delay (Losoncz 2008). Several studies have been conducted to find out what led to this collapse. Many researchers attribute the causes to unjustified speculation in the financial markets (Partnoy 2003, Losoncz 2008, Akerlof-Shiller 2009). Some point to inadequate institutional control of the banking sector as the root of the problem (Bookstaber 2007, Authers 2010, Posner 2010). In addition, there is also a view that the crisis is a rebalancing of the imbalance between the two economic centers - the United States and China (Rajan 2010). There are also theories that focus on national and cultural factors (e.g. Anglo-Saxon stock market speculation) in the development of the crisis (Stuttaford 2010).

The impact of the crisis on the performance of the economy can be measured by changes in GDP. Based on the GDP data for 2009, the year most affected by the crisis, Hungary was

significantly affected by the economic recession in the European Union (EU), with GDP falling by 6.7% compared to the previous year. This ranked Hungary 7th worst in the ranking. By sector, industry, including manufacturing, suffered the most: the automotive industry and closely related industries such as basic metals, fabricated metal products, rubber, plastics and electronics. Of this decline in GDP, the industry accounted for 2.8 percentage points (Kiss 2011, Egedy 2012). The crisis in 2020 led to a 5% drop in GDP, making Hungary the 13th worst performer in the EU (Eurostat 2021). Several previous studies have examined the background and effects of the 2008 crisis from different perspectives, and there are also a number of studies that do not focus on the crisis itself, but also on the period of the crisis because of the research question. The labor market effects of the crisis and the role of the public employment program in response to it have been dealt with by Czirfusz (2019), the spatial differences in unemployment and public employment by Kóti (2020), the vulnerability of the labor market by Alpek-Tésits (2014), and the changes in the spatial concentration of employment by Kiss-Szalkai (2014). Molnár (2013) examined the geographical dimension of the employment effects of the domestic automotive industry after the turn of the millennium, including the role of the 2008 crisis.

Csomós (2013) examined the changes in Hungary's economic centers between 1992 and 2011, taking into account the effects of the 2008 crisis. Nemes Nagy-Lőcsei (2013) defined the year of the global economic crisis as a phase boundary in their analysis of the long-term growth trajectories of counties.

Belyó (2009) also looked at the situation in tourism when examining the recovery from the 2008 economic crisis. Major-Czaller (2016) attempted to measure the impact of tourism subsidies on employment using spatial econometric panel models. They examined the use of subsidies between 2004 and 2013.

Magyar Turizmus Zrt. (2013) analyzed European tourism between 2008 and 2013, with a particular focus on the events that influenced the processes of the period (the global economic crisis of 2008, the volcanic eruption in Iceland in 2011, etc.).

Kincses et al. (2016) present the spending patterns of Hungarian transit tourism participants between 2009 and 2013. They chose this initial year for their study because the global economic crisis marked a breakpoint in the development of tourism and provided an opportunity to show the recovery from the crisis.

Kaszás (2010) also examined the changes resulting from the global economic crisis when examining the 2009 spending of foreign visitors to Hungary, an important issue for tourism. In his research Tömöri (2021) looked at the invisible non-resident tourism in Hungary, which includes one-day trips to Hungary by foreign citizens without accommodation, and the effects of the 2008 crisis.

2.7. Effects of the COVID-19 pandemic

In the case of the SARS-CoV-2 virus epidemic, which emerged at the end of 2019, spread across the globe and then appeared in Hungary on 4 March 2020, it became clear after the first few weeks that its effects were spreading to almost all areas of life (Kincses-Tóth 2020, Mitsis 2021). The mortality rate is influenced by health care, among other factors, and it was therefore necessary to reduce the spread of the epidemic in order to avoid overloading it. However, the associated effects have led to rapid and global changes not seen for a long time. In addition to those directly involved in the management of the epidemic and the health threat that most people face most directly, the activities necessary for work and subsistence have changed (e.g. food shopping, mobility). In many countries, the shift to teleworking has become one of the most important tools. Due to the specificities of the sectors, the implementation of this can be diverse, but Lipták's (2021) research in Northern Hungary showed that the transition to the home office was mostly smooth. For the same reason, shopping, which was almost a daily activity, changed significantly, with consumers preferring to shop online and panic buying and food hoarding, which could even lead to shortages (Sikos T. Restrictive measures were also introduced in the use of enclosed public spaces and outdoor mass events, so that the opportunities for leisure activities, from work to daily activities other than shopping, were significantly reduced. In the context of the Hungarian "first wave", Jóna's (2020) research shows that, while restrictive measures were respected, the use of outdoor public spaces did not cease or even decrease, but rather changed (e.g. more often, closer).

Such a significant reduction in face-to-face contact can have almost incalculable psychological consequences. Social isolation affects different social groups to different degrees, but school-age, poorer and women are the most vulnerable (Mangen-Veale 2020). In countries with lower incomes and less state involvement, employers are more likely to treat those in the black or 'grey' economy more easily, and those who become unemployed for this reason are generally less likely to claim any state assistance (Otieno et al. 2020).

This exacerbates social and territorial inequalities, which can lead to tensions and even greater social discontent and migration (for example: in Africa) (Farese 2020). Diseases spread more

rapidly in areas of higher population density, so that their direct and indirect impacts have been greatest in large cities throughout world history. This will certainly be no different for the current epidemic. Changes in transport habits (a shift towards private transport), the persistence of a major shift of private and official encounters to online spaces, and the ability to manage one's affairs (e.g. shopping, studying, working) from home are likely to become a permanent part of everyday life (Duranton-Puga 2020). This could be facilitated by the spread of smart city concepts, which became fashionable years ago, as digitisation accelerates (Huws 2020).

These processes have also had a significant and very diverse impact on the players in the ICT sector (Healy 2020). The dependence of private individuals, firms and states has increased, and the 'winners' have embarked on even greater developments and portfolio expansions (e.g. e-commerce) than before (Kerr-Robert-Nicoud 2020).

In addition to the changes affecting the daily lives of social groups, macro processes have also changed significantly. The "borderlessness" that had been planned in the EU for decades was taken off the agenda in a matter of weeks. After the future opening of borders, it is expected that the pursuit of security will become the main guiding principle instead of profit and the pursuit of experience (Hajdú-Rácz 2020). Among the global challenges, significantly different scenarios, which are becoming increasingly pronounced in the run-up to the epidemic, could be realized in the context of their impact on global climate change (Scheuch 2021). The positive impact of the economic slowdown due to the epidemic can be demonstrated in the short term. In Budapest alone, during the spring 2020 restrictions, greenhouse gas emissions and other environmentally harmful emissions were significantly reduced in 13 working days, with an increase in the share of home-based work (Varjú et al. 2020).

These complex negative trends are perhaps more challenging than ever for decision-makers almost anywhere in the world. Understanding and addressing these challenges as accurately as possible will also need to be highly multifaceted and location- and society-specific (Mangen-Veale 2020).

The COVID-19 epidemic and its impact can of course be examined from a number of territorial perspectives. The spatial spread of the virus has been studied in Central Europe by Kovalcsik et al. (2021), while Uzzoli et al. (2021) investigated some of the characteristics of the epidemic waves in Hungary. More specifically, Fekete et al. (2021) studied the Balaton Special Holiday Region as a territorial unit. Van Leeuwen (2020) analyzed the differences between urban and rural areas and the relationship between epidemics and spatiality in general. In addition to

spatiality, there have been several studies on specific sectors and actors: Bálint (2021) on the impact of the epidemic on caravanning, Boros-Kovalcsik (2021) on the impact of the epidemic on the Airbnb market in the capital, Finta et al. (2020) and Baranyai et al. (2020) on the situation of local governments.

The Swine flu, SARS, Ebola, MERS and the most recent pandemic, COVID-19, are some of the worst epidemics and pandemics to have ever occurred in human history (Joshi, et. al, 2020). The COVID-19 has disturbed daily life and practically every sector of the economy. The worst affected nations by this pandemic include those with low incomes, developing nations, and developed nations. Lockdown has caused severe disruptions in the economies' employment rates. Theoretically, there is a clear connection between pandemics and unemployment. With the new outbreak, we can draw similar conclusions. Precautionary actions have been put in place whenever there has been a significant pandemic rather than trying to deal with the impacts of it (Kelly, 2020). For instance, the lockdown strategy was adopted globally during the current pandemic (Habicht et al., 2020). Due to the closure of the industrial units, the extensive lockdown measures have emerged as one of the main factors slowing down economic activity. As a result, we have seen extremely high unemployment rates throughout history (ILO-stats). Alarming consequences of the rising unemployment rate include a rise in inequality and poverty as well as higher crime rates (Voßemer et al., 2018).

The expansion of the outbreak and its effected other macroeconomic indicators, such as employment and/or unemployment, provide two difficulties for the European economy at the moment. A long-term economic downturn in the European economies is predicted by several think tanks to be brought on by the economic instability brought on by the present epidemic. According to Wren-Lewis (2020), COVID-19 has negative effects on economic growth, the labor supply, inflation, and manufacturing costs.

Self-employed people are the ones who are most impacted by this epidemic, according to Blundell et al. (2020), who used the UK's LSE-CEP survey to make this discovery. The great majority of self-employed employees said in the same research that they work fewer hours now than they did before the outbreak. This increases their susceptibility to the pandemic further. The similar problem was also stated by Boneva et al. (2020) for the UK, US, and German economies. Their empirical findings show that the majority of independent contractors had a protracted period of unemployment during the current epidemic. Younger workers and those with merely college degrees are more susceptible to losing their jobs. Similar to this, Leka

(2020) investigated the effects of COVID-19 on the Albanian economy and came to the conclusion that this pandemic especially affected nearly every area of the economy. It has had a negative impact on the GDP growth rate, unemployment, inflation, interest rates, and the travel and tourist industry. Fernandes (2020) evaluated the effects of COVID-19 on 30 global economies. The empirical findings show that service economies are more vulnerable and must experience a protracted period of unemployment. In addition, the economy's tourist and commerce industries suffered greatly during the crisis, and many people lost their employment in these fields. In their investigation of the long-term and enduring effects of the current pandemic on economic growth and unemployment, Rodrguez-Caballero and Vera-Valdes (2020) came to the conclusion that these effects are comparably more enduring in terms of unemployment in the UK economy.

Similar to this, Farayibi and Asongu (2020) investigated how COVID-19 affected important macroeconomic factors in Nigeria. According to the study's findings, COVID-19 has a detrimental effect on GDP, the exchange rate, employment, and inflation. In a similar vein, Binder (2020) believes that during the various phases of the present epidemic in the USA, individuals should prepare for prolonged periods of unemployment. In addition to these studies, the researcher found that the patterns in employment and unemployment in industrialized nations are quite comparable. The employment patterns in European nations are much the same as those seen in the USA. According to Coibion et al. (2020), in a situation similar to the US economy, the majority of people who have lost their jobs have stopped looking for work. As a result, the total unemployment rate rises even more. According to Costa Dias et al. (2020), the majority of UK businesses are not advertising new job openings. The report went on to explain that those in low-skilled jobs would suffer the most in this situation.

Despite the fact that a significant epidemic in the UK has also contracted a high skilled labor market. According to Campello et al. (2020), compared to low-skilled employment, higher-skilled jobs have suffered a dramatic fall in the USA. In addition to the current circumstance, we have seen in earlier research that negative shocks mostly have a negative impact on employment levels in many economies. In a similar vein, Boeri and Jimeno (2016) evaluated the effects of the economic downturn on unemployment in European nations. Their empirical results show that nations with greater salary flexibility have seen low unemployment rates, while those with greater employment flexibility have experienced higher unemployment rates. Similar to this, Guichard and Rusticelli (2010) investigated how the financial crisis affected a number of OECD nations and came to the conclusion that these economies had seen

a rise in structural unemployment. Choudhry et al. (2010) conducted excellent research that caught the post-financial crisis landscape and its effects on young employment. The study discovered that young workers experience more hardship as a result of the financial crisis and must endure longer periods of unemployment than their more experienced peers. Numerous research on the COVID-19's effects on oil prices and stock market volatility have been conducted and are available in the literature (Narayan, 2020). (Baker et al., 2020).

Based on the analysis of the Policy Agenda Analytical Institute, prior to the current global crisis, the processes of the globalized economy were largely prosperous, and now the really well-functioning social and economic systems and sectors and enterprises have been/are being put in an impossible situation, which may even lead to bankruptcy despite their successful activities so far. can also cause According to them, the effects of the epidemic on the economy are basically determined by three factors. As a primary factor, the time course of the epidemic is important, in the case of a fast course, more favorable and smaller negative effects are naturally expected. The second main factor is the severity of the course of the epidemic, when determining this, the time of spread of the epidemic, its infection rate (what percentage of the population it affects), and its death rate must be taken into account, since it depends on these how much of the population it affects, and to what extent the workforce is lost periodically or even permanently. If the epidemic is more serious, more significant and drastic state intervention is necessary in order to control the epidemic, which can also strengthen the negative effects. The third factor influencing the economic impact is the economic policy of the given country, in which case the key question is whether there is a way to support the heavily affected economic sectors with budgetary, central bank and other official instruments, whether the state can mitigate or offset unemployment. had a negative impact.

2.8. Pandemic and the global labor market

According to the MTA researchers, the pandemic situation caused by the COVID-19 virus has caused and continues to cause disruptions in many areas, as societies have to face a health, economic and social crisis at the same time. The consequences of the epidemic have been and are being felt directly in the workplace, as a large number of businesses operating in the most diverse economic sectors are facing a situation close to bankruptcy and are forced to reduce working hours or staff. (Csizmadia – Illésy, 2020).

The ILO Monitor report forecasts that the emergency will result in a loss of approximately 6.7 percent of working hours in the second half of 2020, affecting approximately 195 million full-time workers worldwide. The biggest dropouts are to be expected in the Arab

states (8.1%), Europe (7.8%), and Asia and the Pacific region (7.2%). Among the sectors most at risk are the accommodation and hospitality industry, as well as manufacturing, retail, and business and administrative activities. The increase in unemployment in 2020 depends on the measures and developments applied, but based on the report, its level may exceed the ILO's previous estimate of 25 million people at the end of the year. According to current data, four out of five people (81%) are already affected by the partial or complete closure of their workplace on the global labor market. Based on the research, 1.25 billion workers work in those sectors, most of them in the informal economy, which belong to the most vulnerable group in relation to possible staff reductions and the expected decline in wages and working hours. Many of them belong to jobs with low pay and lower cognitive skills, where a sudden drop in income would have a drastic effect. (ILO Monitor, 2020)

The informal economy is part of an economy that is not subject to taxes and is not under government supervision. It is a diversified group of economic activities, companies, workplaces and workers that are not regulated or protected by the state. The informal economy is part of the market economy, which means that it sells goods and services and makes a profit. Unpaid housework and caregiving activities do not contribute to this and are therefore not part of the informal economy. Unlike the formal economy, the activities of the informal economy are not included in the gross national product or the gross domestic product of a country. The informal sector can be considered a gray labor market.

The international and domestic labor market environment is influenced by many factors. According to its social definition, the size and quality of the available population on the labor market is important; what principles and social strategies affect people, well-being and living standards; how social security is enforced; whether there is social and professional mobility. Examining its economic factors, the application of market economy principles (human resource efficiency and profitability, etc.) is fundamental; the availability of appropriate human resources; rationality and flexibility; ensuring the relative balance of supply and demand with the growth of the economy.

The period after the crisis in 2009 was also associated with significant changes in the labor market. On the one hand, globalization and the accompanying economic and social transformation, technological development and the information society impose new requirements on the labor market. On the other hand, a solution must also be found to the problem of the aging of societies and the reduction of territorial differences. In the first quarter

of the 21st century, according to the Europe 2020 strategy, active labor market policy, self-employment, labor market institutions, active and healthy aging, youth employment and other measures aimed at increasing employment and labor mobility are to be supported. From 2012, labor market demand strengthened and by 2017, employment increased significantly, and the unemployment rate decreased to 7.3%. (KSH)

The possibility and at the same time the necessity of the globalization of economic action is determined by technical and technological development. The international flow of capital and its transnational nature play a significant role in the globalization of economic relations. The fundamental factors of globalization include the accelerated development of communication and information technology; on an international level, production and services have been established in both the real and monetary spheres, and are increasing in volume and capital strength; with their foreign investments and company acquisitions operating in the field of sales, transnational and multinational economic and monetary organizations pursuing a broad business policy. (Szentes, 2020)

Globalization also has a significant impact at the sectoral level. Sectoral specialization prevails in the patterns of employment they create as a result of globalized consumption and production. This poses serious challenges for the labor market, which requires proactive adaptation by companies, policies and individuals. Similar to the technological revolution, the wider socio-economic, geopolitical and demographic driving forces of the changes reinforce each other in several directions. The spread of disciplines and jobs across sectors will encourage the development of combined skills, which will put some people in a strong position to compete for increasingly demanding jobs and roles. Of course, all of this depends on the willingness of the economic actors and the responsibility of employers and employees. (Nemeskéri–Szellő, 2017)

Iványék Zádori's study highlights the importance of digitalization from the point of view of the epidemic situation and the labor market, "because the available technology and the degree of digitalization play a prominent role: technology and digitalization made it possible for previously usual economic and social activities a part of it can be implemented in the digital world, in the information society, even without moving places and personal meetings." At the same time, it is important to emphasize that this practice applies to only a part of citizens and employees.

According to CEDEFOP (2017) research, almost half of the jobs in developed economies will be automated in the future due to the innovation of digitization, robotization and artificial intelligence. It also follows that employees are worried that they will lose their jobs or be unable to keep them because of technology. However, the ongoing debate about the disappearance of jobs due to automation is not based on scientific foundations and is surrounded by a very high degree of uncertainty and speculation. Based on the data of the European skills and workplace survey, it appears that men with a low level of education, older workers and those working in non-standard jobs are typically more exposed to the risk of automation. Overall, sectors and occupations requiring medium or lower skills are more likely to be automated, while professional and interpersonal services (such as healthcare or education) are relatively isolated in this respect.

Based on the CEDEFOP (2017) survey, it becomes clear that while one-third of jobs can be "automated" on the surface, many employers are taking steps to help their workers adapt to technological changes, above all by financing their continuous training. At EU level, only 12% of jobs are at "extremely high" risk of automation; these are jobs in which the majority of employees perform routine tasks and there is little need for creativity and social contact, and employers spend nothing on developing the human capital of their employees.

Based on the analysis of the McKinsey Global Institute, before the COVID-19 epidemic, employment in Europe increased in knowledge-intensive sectors such as telecommunications, financial services, real estate and education, while it decreased in manufacturing and agriculture. Pre-pandemic job-based growth favored the highest-skilled workers (such as technical, financial, legal, and health professionals) in all three groups of local economic clusters. Similarly, employment growth was positive for occupations at the lower end of the skill continuum, such as cashiers, construction workers and sewage workers. At the same time, in their opinion, the "loser" target group of digitization (automation) includes those who have also been disadvantaged as a result of COVD-19. About 24 million jobs, almost 50% of jobs displaced by automation, are at risk of being displaced, both by COVID-19 and by automation. The basis of digitalization is the related competencies and the possibilities of their acquisition. The crisis is expected to result in budget cuts, and education may lose a lot. The lack of investments in education and training worsens long-term economic prospects and causes short-term losses for society, the economy, employees and their family members. (Smith et al, 2020)

The pandemic has had an extensive influence on the worldwide economy. As reported by the International Monetary Fund (IMF), there was a 3.3% reduction in global economic growth during 2020, which is deemed as the most severe recession since the Great Depression that occurred in the 1930s (IMF, 2021a). The pandemic's impact can be observed across all sectors of commerce wherein various establishments were compelled to either shut down or reduce their activities due to imposed lockdown and social distancing measures. Besides this, global trade experienced disruptions with substantial difficulties encountered within supply chains.

The COVID-19 pandemic has resulted in a substantial decline in global employment opportunities. The International Labour Organization (ILO) reports that approximately 114 million jobs were lost worldwide during the year 2020 (ILO 2021), with young individuals and women bearing an unevenly high brunt of these losses. Industries such as tourism, hospitality, and retail have been most severely impacted by the outbreak. In addition to this unfortunate scenario, there has also been a marked reduction equivalent to about 140 million full-time jobs in working hours due to the pandemic's effects (ILO 2021).

Governments across the globe have adopted a range of strategies to alleviate the economic consequences stemming from COVID-19. Among these measures, fiscal stimulus has emerged as one of the most prominent with several nations increasing government expenditure in order to support households and businesses during this crisis period. The IMF estimates that worldwide governments have pledged more than $16 trillion for various forms of financial assistance like tax relief, loans, grants among others (IMF 2021). Central banks too have played a crucial role by implementing monetary policies such as asset purchases and interest rate cuts aimed at shoring up their respective economies. In addition, many countries are also offering wage subsidies and unemployment benefits to protect workers who may be adversely affected by this pandemic situation. Its defining features are voluntary singlehood (reinforced by the physical, emotional and financial separation from parents that is increasingly delayed), voluntary childlessness, delayed first childbearing, increasing cohabitation, late marriage, high rates of children born out of wedlock and an alarming increase in divorce (more than one in two marriages in the EU end in divorce), compounded by a growing degree of individualisation. As a result of demographic erosion, employers are increasingly looking to the labour market integration of under-represented groups (women, young people, minorities, the mentally and/or physically disabled, migrants) as the basis for their new employment policies. To illustrate the severity of the situation, the World Economic Forum estimates that Germany's working age population will fall by 6 million in 15 years' time - one reason for the perceived political

openness to accept migrants from the Middle East and North Africa (cf. B. Siskáné SiLasi - L. HaLász - P. Vadnai 2017).

For the generation born in the new millennium, a few career changes during their active years, a career path stalled, a career path diverted, is a natural process. Active working lives in the present and in the future in the same workplace, in similar jobs, will be replaced by jobs with periodically changing and different structures and profiles. This includes the development of skills, abilities, expertise and work experience, giving workers greater individual freedom of response and flexibility to either ride the career wave or temporarily slow down the workload over an increasingly longer period of time.

3. RESEARCH METHODOLOGY

3.1. Research aspects

During my research I have selected four countries: Germany, Greece, Hungary and Sweden. The reason behind my choice was the following: Hungary, because of my residence and the wide availability of data, even in Hungarian as well; Germany, as they are the economic powerhouse of the European Union and several of their policy decisions were followed around Europe; Greece, because they are largely dependent on tourism and that sector was affected the most by the COVID-19 pandemic; Sweden, as they were not introducing strict measures to counter the pandemic, but rather they were trying to reach herd immunity as soon as possible. For a general view, the average of the 27 European Union member states will be included. The United Kingdom would have been the 28th, but with BREXIT their number has decreased. Due to consistency the EU-27 measures will be used, not EU-28.

On timeline level, I will be comparing data between 2017 and 2021. The five year span is chosen to see the pre pandemic situation better while also having two years, which were still largely affected by pandemic

I also separately view male and female statistics because their physical abilities vary, hence their possibility to work in certain industries, for example, construction, some heavy-duty manufacturing (steel) and the public sector (fire fighters, armed forces).

Age is another important factor. The first few variants of the virus were dangerous mostly for elderly and people suffering from chronic diseases. The age aspect is easily measurable and there are credible statistics of it. The age groups I will be analyzing are the following: 20-65 years old; 25-29 years old and 55-59 years old.

Educational level plays an important role in what type of job an individual is able to perform. I will use ISCED 2011 levels, which are defined by ISCED and Wikipedia:

- "Early childhood education (Level 0): Education designed to support early development in preparation for participation in school and society. Programs designed for children from age 3 to the start of primary education.
- Primary education (Level 1): Programs typically designed to provide students with fundamental skills in reading, writing and mathematics and to establish a solid foundation for learning.
- Lower secondary education (Level 2): First stage of secondary education building on primary education, typically with a more subject-oriented curriculum.
- Upper secondary education (Level 3): Second/final stage of secondary education preparing for tertiary education and/or providing skills relevant to employment. Usually with an increased range of subject options and streams.
- Post-secondary non-tertiary education (Level 4): Programs providing learning experiences that build on secondary education and prepare for labor market entry and/or tertiary education. The content is broader than secondary but not as complex as tertiary education.
- Short-cycle tertiary education (Level 5): Short first tertiary programs that are typically practically based, occupationally specific and prepare for labor market entry. These programs may also provide a pathway to other tertiary programs.
- Bachelor's or equivalent level (Level 6): Programs designed to provide intermediate academic and/or professional knowledge, skills and competencies leading to a first tertiary degree or equivalent qualification.
- Master's or equivalent level (Level 7): Programs designed to provide advanced academic and/or professional knowledge, skills and competencies leading to a second tertiary degree or equivalent qualification.
- Doctorate or equivalent level (Level 8): Programs designed primarily to lead to an advanced research qualification, usually concluding with the submission and defense of a substantive dissertation of publishable quality based on original research."

The prior mentioned 8 level then divide up to 3 major categories: Less than primary, primary and lower secondary education (levels 0-2); Upper secondary and post-secondary non-tertiary education (levels 3 and 4); Tertiary education (levels 5-8)

3.2. Research questions and hypothesis

During my research I was trying to find the answers to the following questions:

1. How much does the educational level affect the level of unemployment?
2. Does age really make a difference in the unemployment level in this modern society where digital knowledge is so important, especially during the pandemic?
3. Is gender still a major factor in unemployment?

Based on the literature available and reviewed by me, I raised the following hypothesis:

1. The higher the educational level, the lower the unemployment ratio of the respective population
2. The older population's (55-59 years old age group's) unemployment level will not be affected as seriously as the younger generation's (25-29 years old age group's) during 2020 and 2021
3. Women unemployment will be affected more during in the years of the COVID-19 pandemic than of men

4. THEORETICAL BACKGROUND

4.1. Unemployment background

Unemployment poses a significant concern that impacts individuals, households, and entire global economies. An in-depth exploration of the multifaceted aspects of unemployment necessitates an analysis of diverse unemployment-related notions and their definitions as per the International Labour Organization (ILO).

The concept of unemployment is fundamentally linked to the notion of the unemployment rate. As per the definition provided by International Labour Organization (2020), this term refers to a metric that gauges the proportion of individuals in a given workforce who are currently unemployed but actively searching for employment opportunities. Essentially, it functions as an assessment tool designed to measure those individuals who possess both willingness and ability to work yet face challenges in finding suitable jobs. Furthermore, ILO views this indicator as one among several primary benchmarks utilized for evaluating labor market performance and overall economic growth prospects.

The labor force participation rate, an essential notion concerning unemployment, pertains to the proportion of individuals within the working-age populace who are actively engaged in seeking employment or already employed (International Labour Organization, 2013). This

metric serves as a gauge for assessing both individual inclination towards workforce engagement and labor supply potential. In various nations, shifts in this rate have substantial implications on unemployment rates and other consequences associated with job markets.

Discouraged workers are individuals who have stopped actively seeking employment because they believe that there are no jobs available for them. The ILO defines discouraged workers as "persons who are not in the labor force but who want to work and have looked for a job in the recent past but are not currently looking because they believe that no job is available for them" (International Labour Organization, 2020). The analysis of unemployment requires a thoughtful consideration of discouraged workers who hold substantial potential as a labor supply.

4.2. Unemployment definition by country

The concept of underemployment holds significant relevance in the context of unemployment. It pertains to individuals who are currently employed but face a scarcity of working hours or work in jobs that fail to optimally harness their expertise and competencies. The ILO defines underemployment as "a situation in which a person works fewer hours than he or she would like to, or in a job that does not fully use his or her skills" (International Labour Organization, 2019).

The meaning of unemployment can differ across nations, contingent upon their specific labor market situations and regulations. This essay presents an overview of how Hungary, Sweden, Germany, and Greece define unemployment based on data from the national statistical offices in each country. In Hungary, according to the Central Statistical Office (KSH), individuals who were without work during the reference week but were available for work and actively seeking employment within four weeks before the survey are considered unemployed. This definition conforms with that used by the International Labour Organization as well. Meanwhile, Statistics Sweden defines unemployment as persons aged 15-74 who had no occupation during the survey week while being willing and actively searching for a job over four weeks prior - also aligning with ILO's description of it.

The Federal Employment Agency in Germany provides a distinct interpretation of unemployment as "individuals without employment who have registered themselves with the employment agency and can immediately or within a short time frame accept work" (Federal Employment Agency, 2022), unlike the ILO definition which encompasses all individuals. Conversely, the Hellenic Statistical Authority's (ELSTAT) description of unemployment in

Greece aligns with that of ILO since it includes "the proportion of employed personnel available for labor and actively pursuing job opportunities during the specified week" (ELSTAT, 2022).

To sum up, the precise meaning of unemployment may exhibit some variations across nations. However, it predominantly pertains to people who are jobless, willing to work and making efforts to secure employment opportunities. An unambiguous and uniform understanding of this phenomenon is indispensable for effectively evaluating and contrasting labor market performances among diverse countries as well as throughout various chronological epochs.

4.3. Factors affecting unemployment

Unemployment is an essential economic metric that denotes the percentage of individuals in the labor force who are actively seeking employment but are currently jobless. The unemployment rate can be influenced by diverse factors such as government policies, demographic trends and economic growth. This essay expounds on these variables and their impact on the level of unemployment.

Notably, a robust economy drives job creation opportunities since expanding businesses often create new positions resulting in decreased levels of unemployment rates. Conversely, when an economy undergoes contractionary forces, companies may halt hiring or even lay off workers leading to elevated levels of unemployed persons' percentages. Okun's Law postulates that every 1% reduction in GDP growth could result in a corresponding increase by half percent points for the rate of unemployment (Bureau of Labor Statistics, 2021).

The unemployment rate may be influenced by the age distribution and educational attainment levels of the workforce. Inexperienced young workers could struggle to secure employment, while older individuals might encounter discriminatory practices based on their age. Additionally, job prospects for those with lower levels of education are likely to be limited compared to their highly educated counterparts. The aging population's demographic changes can also contribute to higher rates of unemployment since senior employees may leave without being replaced by fresh recruits. (Diamond, P. 2013)

The unemployment rate may be influenced by government policies. One way this can happen is through supportive policies for business expansion, including deregulation or tax incentives which could lead to more job openings and reduced unemployment rates. Conversely, restrictions on business growth such as minimum wage laws or strict labor regulations might contribute to a decline in employment opportunities and higher levels of

joblessness. Furthermore, programs initiated by the government like job training schemes or insurance plans for those without jobs could serve as safety nets that enable unemployed individuals to find work again swiftly (Diamond, P. 2013).

When businesses are faced with increasing inflation, they may respond by raising prices. However, this can trigger a reduction in the customer demand for their products and services which leads to downsizing of operations or even laying off workers resulting in a rise in unemployment rate. The central bank could intervene by raising interest rates as well if inflation shoots up, consequently further reducing employment opportunities(Diamond, P. 2013).

Technological advances also tend to impact unemployment significantly as companies adopt automation which might replace labor. Although it creates novel job openings like technology and engineering areas, routine tasks might witness an overall decrease in demand leading to lesser job availability for certain groups of skilled workers depending on how tech advancements (Diamond, P. 2013).

4.4. Labor statistics

The global labor market has been substantially affected by the COVID-19 pandemic, as stated by the International Labour Organization (ILO). An approximate of 114 million job positions were eliminated worldwide in 2020, with young employees and females suffering from a disproportionate impact. Furthermore, due to the pandemic's effect, there has been a reduction in working hours equivalent to around 140 million full-time jobs (ILO, 2021).

As of 2021, the global unemployment rate stood at 5.7%, representing an increase of 0.2 percentage points from the previous year (ILO, 2021). The highest unemployment rates were observed in the Middle East and North Africa (8.6%), followed by Latin America and the Caribbean (8.1%) and Europe and Central Asia (7.6%). The lowest unemployment rates were observed in East Asia and the Pacific (4.4%) and South Asia (4.7%) (ILO, 2021).

The unemployment rates in developed countries have varied significantly in recent years. In 2020, the United States experienced a sharp increase in unemployment due to the pandemic, with the unemployment rate peaking at 14.8% in April before gradually declining to 6.0% by the end of the year (Bureau of Labor Statistics, 2021). In the European Union, the unemployment rate increased from 6.7% in January 2020 to 7.5% in January 2021, with the highest rates observed in Greece (16.2%), Spain (16.1%), and Italy (10.2%) (Eurostat, 2021).

In emerging markets, the unemployment rate has also been affected by the pandemic. In China, the unemployment rate increased from 5.2% in January 2020 to 5.6% in December 2020 (National Bureau of Statistics of China, 2021). In India, the unemployment rate increased from 6.7% in December 2019 to 7.1% in December 2020 (Centre for Monitoring Indian Economy, 2021).

5. EMPIRICAL ANALYSIS

5.1. Employment data

5.1.1. Agriculture

Table 1. Number of employed people in the agricultural sector between 2017 and 2021

Unit: thousand

Thousand people	2017	2018	2019	2020	2021
EU 27	9 096	8 862	8 652	8 455	7 483
Germany	531	523	510	490	517
Hungary	222	216	213	212	203
Greece	453	469	453	412	446
Sweden	91	87	86	86	99

Source: https://data.oecd.org/emp/employment-by-activity.htm

Out of the 4 defined industries agriculture had the lowest number of people employed overall. The EU overall employment in the agricultural sector has decreased continuously from 2017 and had a the most alarming drop in 2021. There are many explanations why the employment has declined in this sector. One is the technological advancement, which is constant in the sector, which was previously labor intensive. The COVID 19 pandemic has definitely sped up (Bonadies and Gadsden, 2019) this process because this type of activity is not possible to be executed remotely by the employee. We can say that this is an indirect effect how the COVID has affected the sector. Another reason why the number of people employed has declined in the agricultural sector is the concentration of the farms (Reardon et al., 2018). Due to size synergies, integrating smaller farms allows producers to employ less people because certain activities don't have to be carried out twice thus saving time and resources. Furthermore, physical jobs are not as attractive for the younger generation (Nuorivaara, L. 2022) as it has been previously, meaning as people reach retirement age there are fewer people replacing them. Some products which have higher market demand are not all producible under the European climate, hence have to be imported from elsewhere, shifting the area of production and the location of the workforce.

Even though this is the European picture, all investigated countries, except Hungary, have experience an increase in number of people employed in the agricultural sector in 2021. In the previous 4 years the declining trend was all present. One of the possible explanations is that even though there is an increasing automation present in the sector, unemployed citizens were able to work in this sector due to the open environment and not being affected by the closed environment, which would help the spread of the virus (Swinnen, 2020).

5.1.2. Construction

Table 2. Number of employed people in the construction sector between 2017 and 2021

Unit: thousand

Thousand people	2017	2018	2019	2020	2021
EU 27	12 990	13 234	13 441	12 893	13 173
Germany	2 837	2 821	2 859	2 579	2 445
Hungary	303	333	345	362	375
Greece	149	151	147	140	141
Sweden	342	348	360	352	349

Source: https://data.oecd.org/emp/employment-by-activity.htm

Construction is another industry, similarly to agriculture, which is mostly performed open air. This could mean, that the number of people employed in the sector shouldn't be affected due to health reason. On the other hand, there are many more factors, which have taken their toll on this industry. Disruption in the supply chains, due to the closed borders, meant shortage of materials, equipment or even workforce delayed or even cancelled construction projects, which led to scaling down the employees for the construction companies (Adnan et. al 2020) This was true not only for the ongoing projects, but also starting the new ones. Due to the decline in demand, prices rose, and as financial uncertainty was present, people were not eager to start construction projects in this period (Ayat M. et. al 2023). This of course meant the decrease in demand, hence less need for construction workers.

Especially in Hungary, but also in Europe, government are the biggest customers for construction projects. The pandemic made them restructure their spending in order areas, such as health and welfare (Felix A. 2020), which had higher priority at the time. When the pandemic situation started to normalize in 2021 with wider availability of the vaccines and slowdown of the number of infected. In the EU the number of employed has increased back to 13.2 million people and Hungary (375 thousand) and Greece (141 thousand) has followed this trend. Germany (2.4 million) and Sweden (349 thousand) on the other hand didn't and the number of

employees has declined further. This can be down to the fact that borders were still strict for movement of human capital and both countries employ foreign workers in this industry, who have no citizenship and by leaving the country they were limited in entering the host countries. It will be interesting to see in the following chapters how men and women compare in primary and secondary level education, as in industries like construction, which are mainly open air, but require stronger physics are favoring males.

5.1.3. Manufacturing

Table 3. Number of employed people in the manufacturing sector between 2017 and 2021

Unit: thousand

Thousand people	2017	2018	2019	2020	2021
EU 27	32 183	32 488	32 554	32 211	31 945
Germany	7 931	7 993	8 012	8 180	8 272
Hungary	990	1 005	998	963	984
Greece	358	357	377	371	390
Sweden	507	510	513	500	499

Source: https://data.oecd.org/emp/employment-by-activity.htm

The manufacturing industry provides a third type of trend, which is different from the previous two. The total EU number were increasing up to 2019, when the number of employed reached 32.6 million people, which then declined gradually to 32 million by 2021. This can be explained, similarly to the agricultural sector, that companies had to escalate technological advancement and as a result replace the human workforce with machinery (Bonadies and Gadsden, 2019).. This was also the case for Sweden, where the increase in employment was until 2019 and then following the EU trend decrease for two straight years in 2020 and 2021 to 499 thousand.

Germany was the total opposite of this trend as it had a constant increase in the number of people employed since 2017. Even though automation is widely present in this sector skilled labor is required to keep up the production with maintaining the machines. Also, Germany being one of the power houses of the European economy, especially in manufacturing, had to replace the suppliers from outside of its borders, who couldn't supply due to the closed border, internally (Lan, P.-C. 2022). To counterattack the disappeared supply, they had to increase capacities domestically, leading to an increase in employment, hence the additional 260 thousand employee in 2021 compared to 2019. The government also supported the sector with

tax cuts on Research and Development (Bertschek I. 2023), which attracted further investments in the sector leading to capacity increase. The remaining two countries, Greece and Hungary had both seen a decline in 2020, but then a bounce back in 2021. This is due to limiting the production in the drastic times of the pandemic and also the layoffs because of the supply shortages (Armani et. al 2020). With improved conditions in 2021 the number of employees in the manufacturing sector rose to 984 thousand in Hungary and 390 thousand in Greece, which was an all-time high for the latter, while a close to pre-pandemic level for the prior.

5.1.4. Services

Table 4. Number of employed people in the services sector between 2017 and 2021

Unit: thousand

Thousand people	2017	2018	2019	2020	2021
EU 27	137 762	139 758	141 594	139 996	141 830
Germany	29 712	29 930	30 363	31 273	29 557
Hungary	2 804	2 803	2 851	2 852	2 979
Greece	2 721	2 774	2 857	2 881	2 881
Sweden	4 022	4 087	4 105	4 056	4 104

Source: https://data.oecd.org/emp/employment-by-activity.htm

As we are talking about quite developed countries it is no surprise that the tertiary sector is where most of the population is employed (Gong H. 2002). This is the sector, which has seen the most revolutionary change out of the 4 investigated sector. This change is the spread of remote work. This of course has not favored industries like tourism, which had to shut down completely due to the closed borders. But not just that, restaurant, bars, and all services, which required personal presence were limited or shut down. This the initial decline of 1.6 million people EU-wide to lose their employment. Of course, this affected sub sectors differently, but the net decline is still a number worth to mention. A similar pattern can be observed for Sweden, where there was an initial decline in 2020 (4 million), after the constant growth from 2017 (4 million), and a bounce back in 2021 (4.1 million). Hungary and Greece had a slightly different pattern, as both countries had either kept their 2020 statistics or even continued the already ongoing improvement in 2021 as well. In case of Greece, it is due to the early border opening to ease the pressure which was on the tourism sector. As Greece was one of the first movers in welcoming the tourists, the demand increased, as the available travel destinations were limited, additional workforce was required in the sector, hence the 24 thousand people increase. Hungary was able to maintain the 2019 level with the quick introduction of remote work (

Gábor L. et al. 2022) and the open borders in summer, which also eased the situation for the tourism and hospitality sector especially with bigger freedom travelling domestically. In 2021, the less strict measures on entering the country has attracted tourist in the area, as neighboring countries had limited the entering into their land. Germany is an outlier as the number of employed personals has increased in 2020. The reason behind this, is the introduction of remote work and the increased use of e-commerce services, which had to meet the larger demand and hire additional workforce (Zhao X. 2022). Furthermore, with the Kurz Arbeit initiative people could keep their employment status, although on reduced pay, but it was still something (Recksiedler, C. et. al 2021). The decline observed in the workforce of service industry during 2021 in Germany possibly stems from the protracted aftermath of the pandemic. Despite numerous nations, including Germany, initiating vaccination drives and easing certain limitations on social gatherings and commerce activities, a large proportion of consumers remain apprehensive about partaking in practices that necessitate intimate physical proximity or reinstating pre-pandemic norms of direct human interaction. This has resulted in a waning demand for services such as hospitality, event coordination or tourism leading to significant job cuts within these domains.

5.2. Unemployment data

5.2.1. Total unemployment

Table 5. Unemployment between 2017 and 2021

Unit: %

%	2017	2018	2019	2020	2021
EU 27	7,3	6,6	6	6,3	6,2
Germany	3,5	3,2	2,9	3,6	3,3
Greece	20,4	18,3	16,5	15,5	13,8
Hungary	3,7	3,2	2,8	3,7	3,4
Sweden	5,3	5	5,2	6,6	6,9

Source:https://ec.europa.eu/eurostat/databrowser/view/LFSA_URGAED__custom_5977210/default/table

The complete picture of the countries and the EU average mostly show similar trend. The trend is a decline in unemployment until 2020, then an increase in 2020 and decline again in 2021. Germany and Hungary were both producing not just the same pattern but nearly the same figures as well. Greece was an outlier out of all the investigated counterparties and in a positive way. Everyone expected Greece to be hit one of the hardest of all countries given the weaker economy, which was heavily damaged in 2008 during the Financial Crisis. Furthermore,

Greece's GDP's 21.2% in 2019 was generated by travel and tourism, which was one of, if not the most affected industries by the pandemic. On the other hand, it didn't have the effect, what one might expect, and Greece's unemployment situation improved throughout 2017-2021 by 6.4pp. There were several factors, which contributed to this outstanding performance.

First of all, to support the travel and tourism industry Greece opened their borders as early as 15th of June 2020 encouraging tourist to use this opportunity and travel there. By this move they were able to keep people employed and not keep them up by welfare. Also, the government supported the companies with wage subsidies, tax reliefs and loan guarantees to be able to provide more for a worker or for more workers (Lampas, N. 2020). They also focused on self-employed individuals who were in the most difficult situation with similar support scheme like the companies received (Lampas, N. 2020) For this fairy-tale like situation, we also have a negative example amongst the investigated countries.

Sweden opted not to implement a complete lockdown and instead relied on voluntary measures of social distancing, which could have led to a more gradual recovery in affected sectors. The country's labor market approach prioritizes flexibility and decentralization; however, this model may have played a role in the rise of unemployment during the pandemic since many employees work under temporary contracts that are susceptible to layoffs during economic downturns (Florida, R et. al 2022). Moreover, Sweden's decentralized wage-setting system may have resulted in slower adjustments to wages making it challenging for firms to adapt promptly amid evolving economic circumstances. Further exacerbating the issue was Sweden's welfare state framework based on significant levels of public spending, where decreased tax revenues due to COVID-19 limited government aid provided towards businesses and workers alike (Florida, R et. al 2022).

5.2.2. Total unemployment by educational level

Table 6. Unemployment by educational level between 2017 and 2021 as a percentage of the population available to work in that category

Unit: %

%	Primary					Secondary					Tertiary				
	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021
EU 27	15	13,4	12,5	12,6	12,7	6,3	5,7	5,2	5,5	5,6	4,6	4,2	4	4,4	4,2
Germany	9,2	8,5	7,7	8,8	7	3,3	2,9	2,6	3,1	3	2	1,9	1,8	2,6	2,4
Greece	23,9	21,9	20,7	19,4	16,6	22,3	20,4	18,6	17,3	15,6	15,7	13,7	11,6	11,5	10,6
Hungary	10,1	8,8	8,1	10	9,6	3,3	3	2,5	3,5	3,3	1,5	1,3	1,4	1,7	1,5
Sweden	14,7	15,2	16	20,7	23,8	4	3,6	3,9	4,9	5,7	3,9	3,6	3,5	4,6	4,3

Source:https://ec.europa.eu/eurostat/databrowser/view/LFSA_URGAED__custom_5977210/default/table

Looking at the educational breakdown of the unemployment statistics it is no surprise that the highest value was amongst people with only primary education. Number of jobs are limited, while the trend in the current economy is going towards jobs that require higher educational levels and skills. These skills and knowledge are available through higher education, which is the reason, that unemployment levels tend to be lower for countries with higher development level (Nunez I et. al 2010). On EU-27 level, until the pandemic was constantly improving, due to the ideal economic situation present. Since 2020 we can see a gradual increase in unemployment across both primary and secondary educational level with tertiary being the only exception in 2021. On the other hand, we can also state that decline in employment from 2019 to 2020 wasn't drastic as on primary level only 0.1pp increase, on secondary level 0.43pp increase and on tertiary level 0.4pp increase. To put this in context, during the 2008 Financial crisis, unemployment level on primary level increased by 5.5pp, on secondary level 2.9pp and on tertiary level 2.1pp.

For Germany and Hungary, similar pattern can be observed. It is down to their economy being similar structure-wise and very dependent on each other with Germany being Hungary's biggest trading partner.

Sweden and Greece are outliers once again, just like in case of total unemployment trend. Greece's unemployment rates were improving for the whole of the 5 years period across all three educational levels. On primary level 7.3pp, on secondary level 6.7pp and on tertiary

level 5.1pp. Meanwhile, Sweden being the total opposite and makes an excellent comparison between the two countries. The Swedish unemployment was increasing throughout the investigated period on the primary level (9.1pp) and also on secondary level (2.1pp) but only from 2018. On tertiary level, an improving trend was visible until the outbreak of the pandemic, which returned in 2022 with a 0.3pp decrease in unemployment.

5.2.3. Total unemployment by gender

Table 7. Unemployment by gender between 2017 and 2021 as a percentage of the population available to work in that category

Unit: %

%	Male					Female				
	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021
EU 27	7	6,2	5,7	6	5,9	7,7	7	6,4	6,7	6,6
Germany	3,8	3,5	3,2	4	3,6	3,1	2,7	2,6	3,1	2,9
Greece	16,7	14,4	13,1	12,8	10,5	24,9	23,3	20,8	19	18
Hungary	3,3	3	2,7	3,5	3,3	4,1	3,6	3,1	3,9	3,5
Sweden	5,6	5,1	5,1	6,5	6,7	5	4,9	5,3	6,6	7,3

Source:https://ec.europa.eu/eurostat/databrowser/view/LFSA_URGAED__custom_5977210/default/table

Gender is another factor, which should be taken into account when analyzing unemployment statistics. If we take a look at the EU numbers, we can see, that both genders were following the exact same trend and even same change in percentage as well with only differing 0.1pp in change in 2018 and 2019. This means that the difference in unemployment between men and female has not changed during the investigated 5 years. This is unfortunate for female workers, because between 2017 and 2021 females had higher unemployment than men on the summarized EU labor market. Greece and Hungary fit right into this EU trend.

Hungary had a larger difference between male and female employees (0.8pp), which is in with the EU norm, and it halved by 2019 to 0.4pp. When the pandemic arrived, the difference remained constant between the two categories but by 2021 women statistics improved on a larger rate then men reducing the deficit to 0.2pp.

Greece had similar trend as previously mentioned, but it the difference between the two gender's unemployment is much larger. In 2017 and 2018 there was 8.2pp and 8.9pp difference respectively, which is huge compared to other countries in the comparison. The situation started to improve in 2019 when gap in unemployment between the two genders was closing and the overall male and female unemployment as well. This trend continued in 2020 much better for females as they improved by 1.8pp compared to 2019 decreasing the gap to 6.2pp. On the other

hand, in 2021, the male unemployment decreased by 2.3pp while female unemployment only by 1pp. The Greek unemployment situation has improved throughout 2017 to 2021, but the large employment gap can be due to the following reasons. Women are still responsible for household and duties and taking care of the elderly and infants, hence they have limited time for paying jobs. Furthermore, gender discrimination is still at large in Greece resulting in more male employees for companies, especially for higher paying jobs (Livanos I. et. al 2009). This is the situation regardless of the fact, that women are more likely to have university degrees but still struggle to reach higher paying positions, especially in male dominant industries.

Germany had a different trend to previously mentioned as female unemployment was lower than male unemployment. The movement of the unemployment number were similar to the Hungarian trend, that was decreasing until 2020, then an increase in unemployment in 2020, finally a decrease again in 2021. During the course of this 5 years the difference varied between 0.6pp (closest in 2019) and 0.9pp (furthest in 2020), but remained 0.7pp, which was the same as in 2017. The overall reason why female unemployment was lower than male unemployment is, that women are more likely to complete higher education, even if it is not necessarily the highest paying degrees, which leads to better job opportunities, which are more crisis proof (Leuze K. et. al 2014). In Greece the situation was the same, that women were more likely to complete higher level of education than men, but the discrimination at the workplace is on higher level, which is the main root of the problem.

Sweden was unique once again, as male unemployment was higher than female, but only until 2019. In 2020 male unemployment increase by more (1.4pp) than female unemployment (1.3pp), but that still kept the difference. This has further increased by 2021to a 0.6pp difference, as male unemployment increased by only 0.2pp, while for females it was 0.7pp. Also, it is important note, that unlike for other countries in the comparison, total unemployment by gender was increasing for both years of the pandemic and there was no improvement in 2021. This can be down tot eh fact, that pandemic situation in Sweden didn't progress as well, as in other investigated countries, due to the more relax approach to the pandemic (Florida, R. 2022). Furthermore, immigrants and younger workers are more vulnerable to lay-offs due to their situation and Sweden has welcomed large number of immigrants in the past few years (Pendakur, R. 2021), but about youth unemployment I will be talking down below.

5.2.4. Total unemployment by age

Table 8. Unemployment by age category between 2017 and 2021 as a percentage of the population available to work in that category

Unit: %

%	25-29 years old					55-59 years old				
	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021
EU 27	11	10	9,1	10,3	9,8	6,3	5,5	5,1	5,1	5,4
Germany	5	4,6	4,1	5,4	4,8	3	2,6	2,5	2,9	2,8
Greece	31,2	28,5	25,8	27,2	25	18,5	15,5	13,4	12,8	11,3
Hungary	4,8	4,4	4,6	6,1	5	3	2,4	2,3	3,1	3,1
Sweden	7,8	7,2	7,4	9,5	9,9	5	4,3	4,5	6,1	6,9

Source:https://ec.europa.eu/eurostat/databrowser/view/LFSA_URGAED__custom_5977210/default/table

Age is the last lone factor, which I will be looking at during my analysis. In the EU youth unemployment was higher for all of the investigated 5-year period than older people. Both age groups were experiencing decreasing trend in unemployment between 2017 and 2019. In 2020 youth employment was hit severely and it resulted in a 1.2pp increase in unemployment, while for older people the ratio remained the same. On the other hand, youth employment improved in 2021 by experiencing a 0.5pp increase, while for older people the decline started (0.3pp increase), but it is still one fourth of what the youth experience in 2020. Overall, it is not a surprise for me, as during a crisis the less experienced are affected as they can be replaced more easily than the more experienced people on the job, who have been working for longer, not necessarily at that company, but know more in their respective field of work (Ilmakunnas, P. et. al 2014). Due to this, internships had to be cancelled, as they were providing the least about of value to the companies in short-term and could save them money, which was desperately needed for liquidity. Not just internship, but other entry level positions suffered the same fate. This is true EU wide, because labor laws gives more flexibility to employers to terminate temporary contracts, which is more frequent for younger people (Baranski, M. 2022).

Hungary and Germany were following similar trends in unemployment in this category. Both experiencing overall improvement between 2017 and 2019 both in the youth and the older age group. In these two countries both age groups' unemployment increased in 2020 but for the

younger one it was with a larger ratio (1.5pp for Hungary and 1.3pp for Germany). On the other hand, the improvement was also on a higher rate in 2021 as youth employment increased by 1.1pp in Hungary and 0.6pp in Germany, while for the older age group was 0pp in Hungary and 0.1pp in Germany.

Greece experienced another version, as its youth unemployment was following the same trend as Hungary and Germany did, but for the older age group it differed. The younger group experience a decrease in unemployment between 2017 and 2019 by 5.4pp, then a large increase in 2020 by 1.4pp and later, in 2021 another decrease by 2.2pp, which took back the unemployment below the 2019 level. The older group experienced constant improvement between 2017 and 2021 with a total of 7.2pp. With this Greece was the best performer in this category.

Sweden was once again a negative example. The country's unemployment situation of the two investigated groups were degrading with 2018 being the only exception, when the younger group improved by 0.6pp, while the older one by 0.7pp. Overall this situation was unique among the investigated countries, because everywhere else there was mostly improvement before the COVID-19 pandemic and also in 2021. Altogether, Sweden's youth unemployment increased by 2.1pp during the course of the 5 years, while the older group's has increased by 1.9pp.

5.2.5. Total unemployment by gender and education

Table 9. Unemployment of the male population divided into three educational level between 2017 and 2021 as a percentage of the population available to work in that category

Unit: %

%	Primary					Secondary					Tertiary				
	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021
EU 27	14,1	12,5	11,5	11,6	11,5	5,8	5,2	4,7	5,1	5,1	4,1	3,8	3,6	4,1	3,9
Germany	10,6	10,2	9	10,1	7,9	3,6	3,2	3	3,6	3,4	2	1,8	1,8	2,5	2,4
Greece	21,5	19	17,9	16,4	12,4	17,2	15,2	14,3	13,8	11,3	12	9,6	8,1	9	8,3
Hungary	9,7	8,5	7,5	9,7	9,2	2,9	2,7	2,4	3,3	3,1	1,3	1,1	1,2	1,5	1,5
Sweden	13,8	13,2	12,7	17,8	19,1	4	3,4	3,7	4,5	5,3	4,6	4,2	4	5	4,5

Source:https://ec.europa.eu/eurostat/databrowser/view/LFSA_URGAED__custom_5977210/default/table

Table 10. Unemployment of the female population divided into three educational level between 2017 and 2021 as a percentage of the population available to work in that category

Unit: %

%	Primary					Secondary					Tertiary				
	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021
EU 27	16,2	14,9	14	14,2	14,6	6,9	6,3	5,8	6,1	6,2	5,1	4,6	4,3	4,7	4,5
Germany	7,5	6,6	6,3	7,3	5,8	2,9	2,4	2,3	2,7	2,5	1,9	1,9	1,8	2,6	2,5
Greece	28,1	27	25,2	24,1	23,7	29	27,4	24,7	22,2	21,6	19,1	17,7	15	13,9	12,8
Hungary	10,5	9,1	8,7	10,4	10	3,9	3,5	2,8	3,8	3,7	1,6	1,6	1,5	1,9	1,5
Sweden	16,1	18,3	21,3	25,3	31,1	4,1	3,9	4,3	5,5	6,3	3,4	3,1	3,2	4,2	4,1

Source:https://ec.europa.eu/eurostat/databrowser/view/LFSA_URGAED__custom_5977210/default/table

After exploring the individual factors, which have effect on unemployment now it is time to explore synergies between them. Now I am going to explore the connection between gender and education. The first thing where we can differentiate is the population with primary education. The number of positions that be performed by people with only primary education is more limited than for the ones with higher educational level (Deighton, K. et. al 2023). Industries, which employ people with primary education are mostly construction, agriculture, and manufacturing. In the above-mentioned industries not all positions are available with only

primary education, but majority of them are connected this level. On EU level, all three industries experienced a decrease in employment (Table 1, 2 and 3) during 2020. As a result, for men the unemployment level increased by 0.1pp, while for women it rose by 0.2pp. In 2021 the situation stabilized for men and even improved by 0.1pp, while for women the situation worsened by 0.4pp. One of the possible explanations is the increase in the number of people employed in the construction industry (Table 2), which primarily a male dominant sector due to the physical necessities that come with the job (Hulls, P.M. et. al 2020).

Also, as previously mentioned, when comparing male and female unemployment, women are more likely to be in unpaid jobs like caretaking of family or being a mother at home, which largely contributes to higher numbers in their unemployment as their options for part time or remotely doable jobs are more limited than for women with higher education (Alonso, C. et. al 2019). This was the case for 3 of the 4 investigated countries and the EU as well, with Germany being the outlier. Of course, care taking, and family first attitude is not limited to women with primary educational level but as seen in the statistics the level of unemployment for women with secondary education is significantly lower than for the ones with primary. Once again there is an exception here with Greece, where in 2017 (by 0.9pp) and 2018 (by 0.4pp) the unemployment level of women with primary education was lower than for the ones with secondary education. When we look at the tertiary education level, the unemployment is even lower than for the secondary educational level, understandably.

There is difference in the unemployment level between two genders on tertiary education level. On EU level, the difference was around 0.8pp between 2017 and 2019, then decreased to 0.6pp in 2020 and 2021. In case of Hungary, the trend is similar, but the overall level is much lower by around 3pp lower in of all of the investigated years. The difference between the two genders was also lower between 0.3 pp and 0.5pp between 2017 and 2020 and by 2021 they were on the same level (1.5%). Germany was also following similar trend, but the difference was even smaller between the two genders than in case of Hungary, amounting to maximum 0.1pp or even broke even in 2019. Gender discrimination can be a leading cause to larger differences in the employment level of the two genders, especially in the tertiary sector (Livanos I. et. al 2009). For example, in the primary sector it is more based on physical characteristics, while as we advance up on the sectors it is becoming less crucial. Greece on the other hand had much higher difference between 2017 and 2019 fluctuating between 7.1pp and 8.1pp. The difference significantly dropped to 4.9pp in 2020 and even further to 4.5pp in 2021. In the earlier years the signs of gender discrimination can be seen more clearly, but there has

been a change of wind. In 2019, the New Democracy Party has won the Greek election and by 2020 and 2021 they introduced economic reforms to attract foreign investors as well educational reforms to improve skill and knowledge level of the younger population (Mylonas, Y. 2021). When a country tries to attract foreign investors, equality is an important factor as the company can have attract negative attention in the media for unequal treatment of the workforce. Also, these international companies have strong values already, which they always promote, and equality is one of them.

Sweden in once again an outlier. This time, it is due to women with tertiary education had lower unemployment level during all five years. The difference was around 1.2pp in 2017 and 2018, which shrank to 0.8pp by 2019 and 2020. By 2021 there was only 0.4pp between the two genders. The reason behind this situation is, that Sweden has implemented gender equality policies for a considerable period, including flexible working hours, parental leave, and cost-effective childcare. These measures can facilitate women to manage work and family commitments more efficiently resulting in increased participation of women in the workforce (Lane, L., & Jordansson, B. 2020). The proportion of Swedish females with tertiary education surpasses that of males which may provide them an upper hand concerning job competitiveness and mitigating unemployment risks (Støren L. et. al 2010). A few employers may display favorable behavior towards hiring and promoting female candidates leading to a decreased rate of unemployment among highly educated women in Sweden (Lane, L., & Jordansson, B. 2020).

6. CONCLUSION

After conducting the research and the analysis some clear patterns could be observed. First of all, Hypothesis 1, which was about the population with tertiary education. In case of all of the countries, the unemployment level was at the lowest for people with tertiary education. The reason behind this is the investigated countries' economic structure. In all four countries the service industry had the highest amount of people employed (as seen in Table 4), which require the highest education level out of all the sectors in general. Furthermore, if we look into it, unemployment level was even lower for females and the 55–59-year-olds. The prior situation was true for countries with higher development, like Germany, Hungary and Sweden, because women are more likely to attend higher education leading to more favorable chances when seeking employment. This is also true for Greece, but what lacks there is the equal treatment of women in the workplace. Gender discrimination is one of the main underlying reasons behind higher female unemployment together with family duties. Furthermore, the age factor is also understandable as bigger experience in the field of work means more available jobs on the

market, not just entry level, which require less experience, more focused on the younger workforce. Based on my research the Hypothesis 1 is accepted.

Hypothesis 2 was more focused on the age factor, rather than the education or the gender. This was a COVID specific question, because as it was mentioned during the literature review the younger generation were more vulnerable to the pandemic as they are not as they don't possess the experience of an older individual. This is completely understandable as just by the number of available years to them and some of them are just out of university. The 25-29-years-olds had higher unemployment than the 55-59-years-olds in case of every country investigated throughout the 5 years. In case of the EU-27, Germany and Hungary the pandemic took its toll in 2020 on the employment, but in 2021 youth employment was lower already. There were exemptions, for example, in case of Greece the unemployment of 55-59-years-olds was constantly decreasing through 2020 and 2021, which was unique. Sweden was the worst performer, mostly in every category regarding increasing unemployment. Once again Hypothesis 2 accepted.

The third and final hypothesis was about gender. This was an interesting one, as nowadays we are experiencing change in how women are relating to careers. First, the number of women is large in higher education than of men, but most of the caretaking and family related tasks are still female dominant. Furthermore, in developed countries, like the ones present in the study are laying more and more emphasis on gender equality in the workplace leading to higher number of women employees, hence decreasing female unemployment. As a result, on EU level, there was no difference in the change of unemployment between the two gender. In Germany, the overall unemployment of women was lower already, but next to this they were also affected less than men. In case of Hungary, the initial change in 2020 was the same between the two genders, but them female unemployment improved on a higher rate than men's. In case of Greece we cannot speak at all about increasing unemployment, because they were constantly improving when comparing the two genders' situation, but during the covid affected years, female unemployment improved on a larger rate. The only country, that could solidify the hypothesis is Sweden, but they are overall in a bad situation. There was a turning point in 2019, when female unemployment overtook men's and proceeded to increase on a larger rate until 2021. Overall, I would say, that female unemployment was not affected worse than men, even so it cut the gap, which was already present at some places. Hypothesis 3 rejected.

After concluding my thesis, it was really interesting getting deep in the smaller factors affecting the labor market around as, especially because it was different from what I saw around myself, in my little “bubble”. But this is the point of research and expanding the knowledge and getting to know the countries around us, which could come handy when working for a multinational company and having international projects.

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