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The role of human capital in strengthening regional economic resilience

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THE ROLE OF HUMAN CAPITAL IN STRENGTHENING REGIONAL ECONOMIC RESILIENCE

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Introduction: the importance of human capital in supporting growth and development

In general terms, human capital refers to the knowledge, skills, abilities, and other qualities possessed by individuals that contribute to their productivity and economic value (The World Bank, 2023). In this regard, human capital represents a crucial factor in supporting growth and development at both individual and societal levels, thus having a significant impact on a wide range of areas, from economic productivity, innovation and global competitiveness, to human development and long-term sustainable growth. There is a rich and well-established scientific literature that focus on the key role that human capital plays in supporting growth and development (Barro & Sala-i-Martin, 1995; Hanushek & Woessmann, 2008; Acemoglu & Angrist, 2001). Moreover, the latest reports in this direction (OECD, 2023; The World Bank, 2023; UNHDP, 2023; European Commission, 2023) ground human capital as a critical driver of growth and development as it empowers individuals, enhances productivity, fuels innovation, and contributes to social progress. As such, investing in education, healthcare, skill development, and creating an enabling environment for human capital growth is essential for building sustainable and prosperous societies.

What spill-over effects induces human capital development?

First, human capital plays a significant role in driving *economic productivity and growth*. Well-educated and skilled individuals tend to be more productive in their work, leading to increased output and efficiency in various sectors of the economy. By investing in education, training, and skill development, societies can enhance their human capital, which positively impacts economic performance.

Second, human capital is a catalyst for *innovation and technological progress*. Individuals with strong intellectual capabilities and expertise are more likely to generate and adopt new ideas, leading to advancements in technology, processes, and products. Countries that prioritize education and research and development (R&D) tend to foster an environment conducive to innovation and reap the benefits of technological advancements.

Third, in today's globalised economy, countries compete not only based on their natural resources or physical infrastructure but also on the skills and talents of their people. Nations that prioritise human capital development gain a *(global) competitive edge* by fostering a highly skilled and adaptable workforce.

Fourth, human capital development goes beyond economic benefits, having profound *social and human development implications*. Access to quality education, healthcare, and other essential services enhances people's well-being, empowers individuals, and contributes to social cohesion. Investing in human capital is crucial for reducing poverty, improving health outcomes, promoting gender equality, and fostering social inclusion.

Fifth, human capital is a fundamental driver of *long-term sustainable growth*. When societies prioritize education, healthcare, and skills development, they lay the foundation for a knowledgeable and healthy workforce capable of driving productivity, innovation, and competitiveness. This, in turn, attracts investment, creates employment opportunities, and raises living standards, leading to sustained economic growth and development. This enables them to attract investment, stimulate entrepreneurship, and participate actively in the global knowledge economy.

Finally, in a rapidly changing world, the ability to adapt and learn new skills is crucial. Human capital equips individuals with the *flexibility and resilience* needed to navigate evolving labour markets and technological disruptions. Continuous learning and upskilling contribute to individual employability, job satisfaction, and overall economic resilience.

Six reasons why regions and countries should invest more in their human capital

At regional and national level, the role of human capital in strengthening economic resilience is particularly significant. The extensive literature in regional economics (Cappelli et al., 2021; Huang, 2021; Martini, 2020, Pizzuto, 2020; Palekiene et al., 2015; Martin and Sunley, 2015; Masik and Rzyski, 2014; Crescenzi et al., 2013) highlights areas in which the human capital proved to be essential in fostering and strengthening economic resilience across regions. As such, according to the mentioned studies, countries and regions that have invested in developing their human capital proved to be more resilient because they are:

1. *More flexible and adaptable*: Regions with a well-developed human capital base are better positioned to adapt to economic shocks and changing circumstances. Skilled workers can readily acquire new skills, retrain, or switch occupations when necessary. They have the ability to respond to technological advancements, market shifts, or industry disruptions. The flexibility of human capital enables regions to adjust their economic structure and seize emerging opportunities.

2. *More productive and innovative*: Skilled workers can effectively utilize resources, technologies, and information to drive productivity gains. They possess the knowledge and abilities to adapt to changing market conditions, identify opportunities, and innovate. A region's ability to generate and apply new ideas, technologies, and processes is critical for its resilience in the face of economic challenges.

3. *More oriented towards entrepreneurship*: Individuals with strong human capital are more likely to possess the necessary skills, knowledge, and networks to start and grow successful businesses. Entrepreneurship can diversify the regional

economy, create jobs, and contribute to its resilience by reducing dependence on specific industries or sectors.

4. *More attractive for well-educated and talented workers*: A region's human capital is a crucial factor in attracting investment and talent. Businesses seek locations with a skilled workforce to optimize their operations and stay competitive. Regions with a well-educated and talented labour pool are more likely to attract companies, stimulate job creation, and foster economic growth. This virtuous cycle of attracting investment and talent further strengthens the region's economic resilience.

5. *More knowledgeable*: Human capital fosters collaboration and knowledge exchange within a region. Skilled workers can collaborate effectively, share expertise, and engage in innovation networks. Regions with strong human capital often have vibrant innovation ecosystems, including universities, research institutions, and industry clusters, where knowledge and ideas flow freely. Such collaboration and knowledge exchange enhance regional competitiveness and resilience.

6. *More engaged*: Human capital is closely linked to social and institutional capital, which refers to the quality of institutions, social networks, and relationships within a region. Regions with strong human capital tend to have engaged communities and robust institutional frameworks. This social and institutional capital supports effective governance, cooperation, and collective action, which are essential for regional economic resilience.

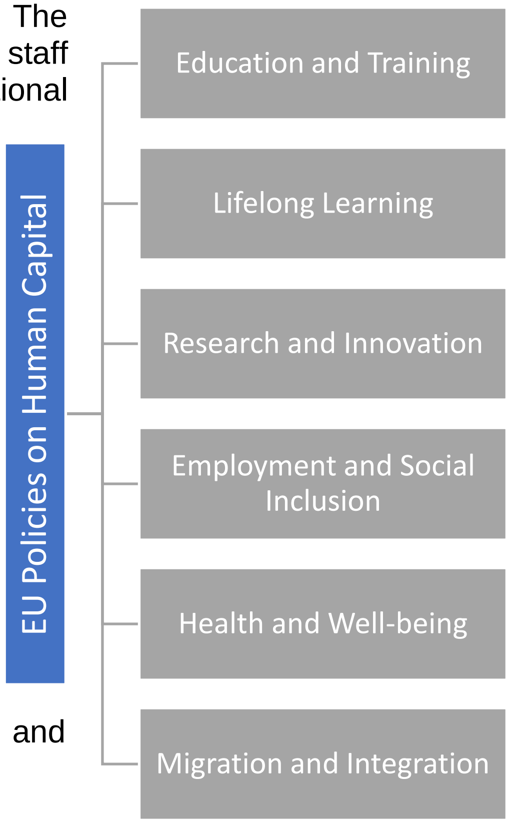
For these reasons, it is no wonder why policy and decision makers shall orient their attention and actions towards building a strong foundation of human capital that can drive long-term economic resilience and prosperity at national and regional levels.

2. The European Perspective – capturing differences among member states

The European Union (EU) has long-acknowledged the importance of human capital in supporting growth and development and has implemented various policies to promote its development. As such, the human capital dimension is incorporated in various key European policies, from education to health and migration.

What is the EU doing about fostering human capital?

First and foremost, the EU has prioritized *education and training* as essential components of human capital development. The Europe 2020 Strategy sets targets for reducing early school leaving rates and increasing the proportion of young people with tertiary education. The Erasmus+ program promotes student and staff mobility, cooperation between educational institutions, and innovation in teaching and learning methods. The European Qualifications Framework (EQF) facilitates transparency and recognition of qualifications across member states.



Second, the EU emphasizes *lifelong learning* to enhance individuals' skills and employability. The European Skills Agenda aims to ensure that people can acquire the necessary skills throughout their lives. In this regard, through the European Social Fund+ (ESF), the EU supports initiatives for adult learning, upskilling, and reskilling to address skills gaps and promote inclusive growth, while also encourages the recognition of prior learning and the validation of non-formal and informal learning.

Third, the EU promotes *research and innovation* to foster human capital development. The Horizon Europe program funds research and innovation projects, aiming to advance knowledge, technology, and competitiveness. The European Research Area (ERA) facilitates collaboration and coordination among European research institutions. The European Institute of Innovation and Technology (EIT) supports knowledge and innovation communities in various fields.

Fourth, the EU focuses on promoting *employment and social inclusion* to support human capital development. In this regard, the ESF+ also invests in employment, social inclusion, and skills development programs to address unemployment, poverty, and social disparities. Furthermore, the European Pillar of Social Rights sets out principles and rights to ensure fair and inclusive labour markets, whereas the Youth Guarantee initiative aims to provide young people with a quality job, apprenticeship, or education within a certain timeframe; furthermore, the EU Youth Strategy has built a solid framework for supporting its youth policy cooperation for the period 2019-2027. This strategy fosters youth participation in democratic life, supports social and civic engagement and aims to ensure that all young people have the necessary resources to take part in society.

Fifth, the EU recognizes the importance of *health and well-being* in human capital development. In this endeavour, the European Commission works on improving public health and reducing health inequalities across member states through the ESF+ that also invests in health-related initiatives, including healthcare workforce development and promoting healthy lifestyles.

Finally. given the diverse population within the EU, policies on *migration and integration* are essential for human capital development. The EU supports integration programs that facilitate the social and economic inclusion of migrants, recognising their potential contributions to the workforce and society as a whole.

Considering these key policies and initiatives implemented at European level to promote human capital development, it is clear that, in general, the EU strives to create an environment where individuals can acquire the necessary skills, access quality education and training, enjoy good health, find meaningful employment, and participate fully in society. However, although there is a general common European framework and consensus on fostering and supporting human capital development, the EU member states display various differences and gaps.

What are the main differences between EU's member states?

Despite EU's efforts to eliminate development gaps, there are several disparities that hinder the union's economic resilience. In this regard, the role of human capital in strengthening regional economic resilience can vary among European Union (EU) member states due to differences in their *education systems, skills levels, labour market conditions, and regional disparities*. Considering the high diversity of countries that the EU encompasses, it is no wonder that there are several discrepancies among EU member states regarding the human capital development, across various sectors, as follows:

Education & Skills	EU member states exhibit variations in education systems and skills levels, leading to differences in human capital development across regions. Some countries have well-established education systems with high levels of investment in education and training, resulting in a skilled workforce and stronger regional economic resilience. However, other member states may face challenges in educational quality, access, or skill mismatches, which can hinder their regional economic resilience.
Economic Structure and Industry Composition	The economic structure and industry composition of member states can influence the role of human capital in regional economic resilience. Countries with a knowledge-intensive economy, such as those with strong technology, research, and innovation sectors, tend to rely heavily on highly skilled workers. In these cases, human capital plays a crucial role in driving regional economic resilience by fostering innovation, entrepreneurship, and competitiveness. However, regions heavily reliant on traditional industries or facing structural challenges may require additional efforts to adapt their human capital to new economic realities.
Labour Market Flexibility and Mobility	Labour market flexibility and mobility can affect the role of human capital in regional economic resilience. Countries with flexible labour markets and robust mobility between regions enable workers to relocate to areas with better economic prospects. In such cases, human capital can contribute to regional economic resilience by

	facilitating labour market adjustments and filling skill gaps. Conversely, regions with limited mobility or rigid labour markets may face challenges in leveraging their human capital for resilience.
Regional Disparities and Cohesion Policies	The EU experiences regional disparities in economic development, with some regions lagging behind others. Cohesion policies aim to reduce these disparities by investing in human capital, infrastructure, and innovation in less-developed regions. Member states with greater regional disparities may have a stronger focus on leveraging human capital to strengthen regional economic resilience through targeted policies and investments.
Innovation Ecosystems and Collaboration	Differences in the strength of innovation ecosystems and collaboration networks across member states can influence the role of human capital in regional economic resilience. Regions with vibrant innovation ecosystems, including research institutions, universities, and industry clusters, create an environment conducive to knowledge creation and diffusion. Human capital plays a critical role in driving innovation, productivity, and competitiveness in these regions, contributing to their economic resilience.

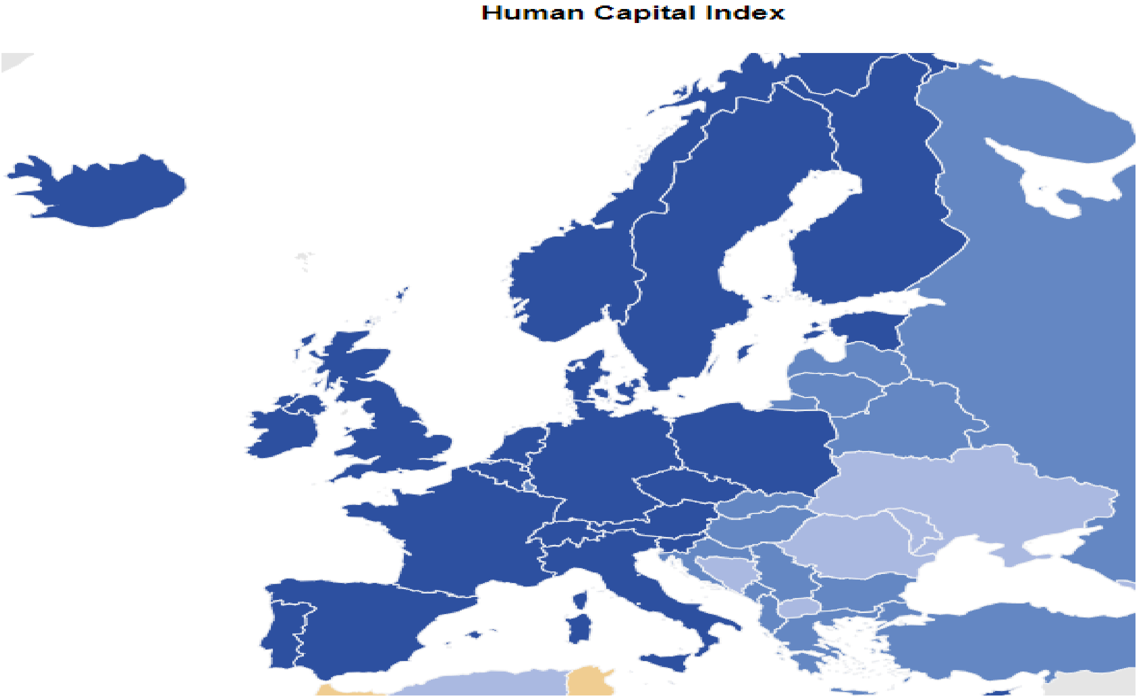
It is important to note that the specific factors impacting the role of human capital in regional economic resilience can be complex and multifaceted. National and regional policies, economic conditions, governance structures, and historical factors also contribute to the observed differences among EU member states. Efforts to strengthen human capital and enhance regional economic resilience often require a combination of targeted education and training policies, investments in innovation and entrepreneurship, regional development strategies, and coordinated actions at various levels of governance.

How do we measure and monitor the human capital development?

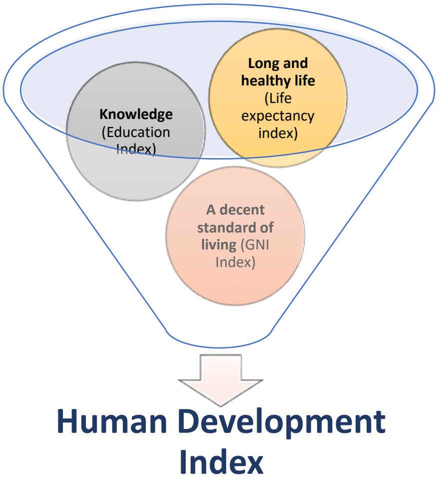
Human capital development is generally measured and monitored in the European Union (EU) through specific methodologies and indicators. Since methodologies and indicators vary, the EU continuously refines its measurement frameworks to align with evolving priorities and challenges. To measure and monitor the various dimensions of human capital development, the EU relies on a combination of data collection, surveys, statistical analysis, and reporting systems. Eurostat, the statistical office of the EU, plays a central role in collecting and analysing data across various domains (i.e. quality of education, health, labour market, innovation, etc.). Additionally, reports and studies from international organizations, such as the World Bank, the United Nations, or the OECD, also provide insights into human capital development in EU countries. As such, the two most frequently referred to and known composite indexes that integrate various components of human developed and are primarily used by the EU to monitor human capital trends are the Human Capital Index (HCI), developed by the World Bank (Figure 1) and the Human Development Index (HDI), developed by the United Nations. HCI is a composite index developed by the World Bank and it provides a new definition of human capital and quantifies the contribution of health and education to the productivity of the next generation of workers.

First, according to the data provided by HCI (Figure 1), there can be noted a *clear distinction between the western and eastern members of the EU*. Although the majority of member states have a highly developed human capital with scores above 70, there are countries at the eastern borders of the EU that scored lower in this regard, such as Romania (55.9), Bulgaria (59.8), Slovakia (64) Lithuania (66), Hungary (66.1), Latvia (66.5), and Greece (66.9). On the one hand, countries from the traditional Central and Eastern European countries (CEEc) group like Poland (72.2), Czechia (73.2) and Estonia (74.6), have managed to have their scores above 70. On the other hand, the highest scores were registered by the member states in the north like Sweden (78) or Finland (76.5), but also by the founding members in the west like The Netherlands (77.8), France (74.5) or Germany (73.6).

Figure 1. Map of the HCI (2020)



Source: Author's representation based on HCI data (World Bank, 2023)

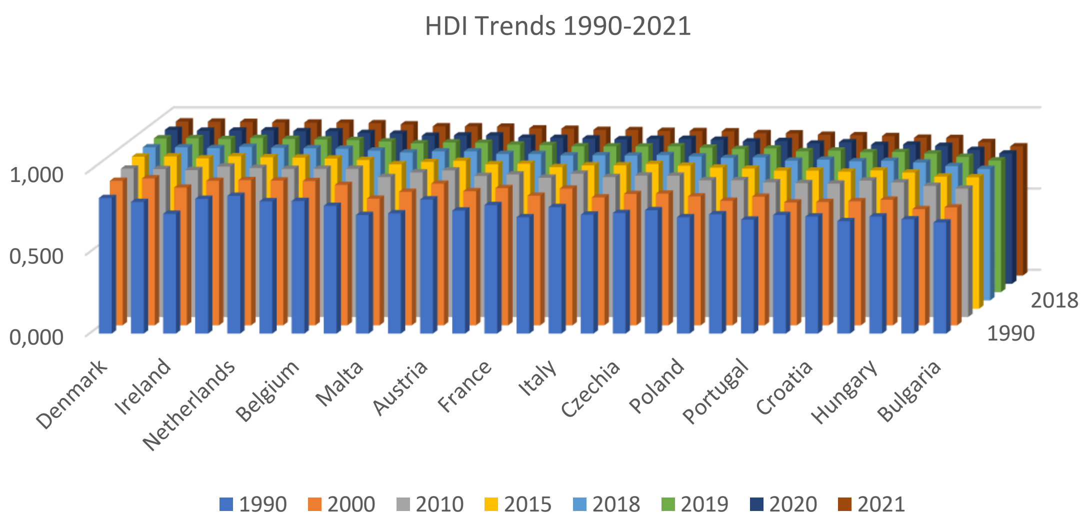


Last but not least, the most comprehensive composite index that measures and monitors human development globally is the Human Development Index (HDI); subsequently, HDI assesses the overall well-being and development of a country by taking into account specific factors such as *life expectancy, education, and income*. The latest available data from the [United Nations Development Programme (UNDP)](#) provides insights into the HDI rankings of European member states and also highlight, similarly to HCI, a clear *west-east divide* in terms of human development.

Human Development Index – main trends since the '90s

Overall, compared to the global arena, all of the EU member states are considered countries that have *very developed human capital*, having scores above 80. The only exception is Bulgaria, that over the 1990-2010 timeframe has met scores that were lower than 80.

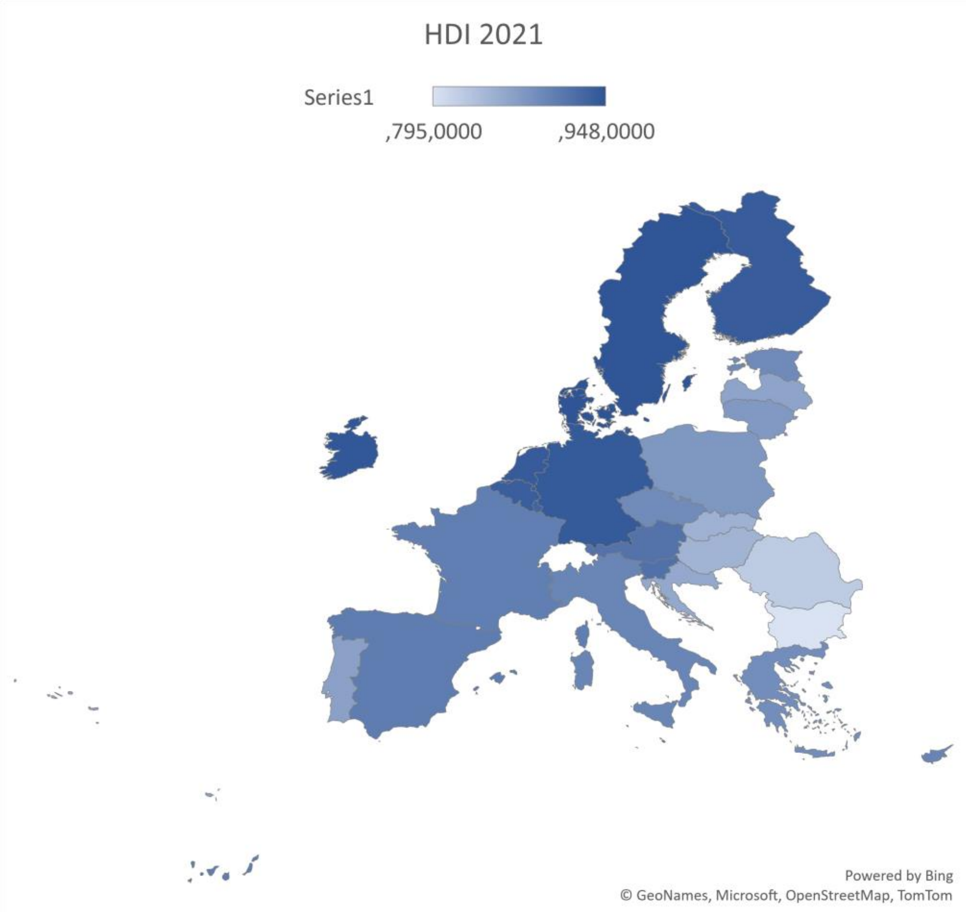
Figure 2. Trends of human development for EU-27 (1990-2022)



Source: Author's representation based on HDI data from UNDP(2023)

Generally, it can be noted a steady increase in HDI for all of the EU member states from '90s to present days. Moreover, it can be noted that the best performers are generally countries situated in the northern / western part of Europe, with developed strong economies, whereas the post-communist "new" members score the lowest in the human development department. However, despite being in the “highly developed” club of countries at global level, the member states of the EU have shown consistent gaps between them, with a general *west-east divide*. The greatest progress since the ‘90s was registered by Ireland (from 0.74 to 0.94), Malta (from 0.73 to 0.92) and Slovenia (from 0.74 to 0.92).

Figure 3. HDI scores for EU-27 (2021)



Source: Author’s representation based on data provided by UNDP (2023)

The latest values for HDI were registered in 2021 (Figure 3) and they range around an average of 0.896 at EU level with a GINI coefficient average of 30.9.

There could also be noted a clear distinction between old and new member states in terms of human development and inequalities.

The best scores were registered by countries in the northern part of the EU, followed by the western states, with the lowest scores in the eastern part of the continent. In this regard, the best performers are:

1. *Denmark*, a country known for its high standard of living, social cohesion, and well-functioning institutions. In 2021 report, Denmark had an HDI value of 0.948, reflecting its strong human development.
2. *Sweden*: According to the 2021 HDI, Sweden scored a value of 0.945, indicating high human development. Similar to Denmark, Sweden has a strong welfare system, high life expectancy, and a well-developed education system.
3. *Ireland* has met an impressive evolution in terms of human development since the 90s and is currently among the top performers in the EU, with an HDI value of 0.945, reflecting high levels of education, healthcare, and income.
4. *Germany*, as the largest economy in the EU, has made significant progress in human development with an HDI value of 0.942, reflecting high life expectancy, educational attainment, and income levels.
5. *The Netherlands* is renowned for its high-quality education, robust healthcare system, and prosperous economy. In 2021, the Netherlands had an HDI value of 0.941, indicating strong human development.

At the opposite end of the spectrum, the EU countries that have historically ranked lower on the Human Development Index (HDI), along with their corresponding HDI values are:

1. *Bulgaria*: which in 2021 had an HDI value of 0.795. While efforts have been made to improve human development indicators, Bulgaria has faced challenges related to income inequality, education, and healthcare.
2. *Romania* has made progress in human development over the past three decades, but it still faces socio-economic challenges. In the 2021 report,

Romania had an HDI value of 0.821, reflecting areas for improvement in education, income, and life expectancy.

3. *Hungary* has made significant strides in human development since the ‘90s. However, it still faces challenges related to income inequality and education with an HDI value of 0.846.
4. *Slovakia* has faced economic challenges in recent years, impacting its human development indicators. In 2021, Slovakia had an HDI value of 0.848. Efforts have been made to address issues related to income, education, and healthcare.

3. Main factors of disparities in human capital development at EU-27 level

Disparities in human capital among EU member states have been a longstanding challenge that affects the overall competitiveness and economic development of the European Union. These disparities can be attributed to various factors, including *historical, socio-economic, and educational differences*.

Historical factors

The differences in development between Western and Eastern countries in the European Union (EU) can be attributed to a variety of *historical factors*. These differences have their roots in geopolitical, economic, and societal developments, including the legacy of the Cold War and the transition from centrally planned economies to market-oriented systems.

First, the Cold War has created a stark contrast in development between Western and Eastern countries. Western European countries, benefiting from the Marshall Plan and integration efforts such as the European Economic Community (EEC), experienced economic growth and political stability. In contrast, Eastern European countries fell under Soviet influence and were subjected to central planning and socialist economic models.

Second, Eastern European countries adopted centrally planned economies based on state ownership and control. These systems prioritized heavy industry and collective farming, often at the expense of consumer goods and market competition. In contrast, Western European countries embraced market economies with private ownership and entrepreneurship. The market-oriented approach facilitated innovation, trade, and economic growth, leading to higher living standards.

Third, the fall of the Berlin Wall in 1989 and the subsequent collapse of the Soviet Union led to a wave of democratization and economic transition in Eastern Europe. Many Eastern European countries sought closer integration with Western Europe and pursued EU membership. However, the economic disparities between Western and Eastern countries posed challenges during the accession process. Western European countries had more advanced economies, established institutions, and higher living standards, while Eastern countries faced the need for economic restructuring and institutional reforms.

Fourth, Eastern European countries embarked on significant economic reforms, transitioning from centrally planned economies to market-oriented systems. This process involved liberalizing trade, privatizing state-owned enterprises, establishing regulatory frameworks, and attracting foreign direct investment. While these reforms presented opportunities for economic growth, they also posed challenges such as unemployment, income disparities, and social adjustments.

Fifth, The EU implemented cohesion policies to address economic disparities between member states, including the Instrument for Pre-Accession Assistance (IPA) for candidate countries and the European Structural and Investment Funds (ESIF) for member states. These funds aimed to promote infrastructure development, regional convergence, and social cohesion in less-developed regions, including Eastern European countries.

Sixth, over time, Eastern European countries have made significant progress in catching up with Western European countries in terms of economic development. Accession to the EU provided opportunities for increased trade, investment, and convergence with Western standards and institutions. However, challenges remain, including differences in income levels, productivity, and institutional capacity. Efforts are ongoing to foster sustainable and inclusive growth across all EU member states.

Socio-economic factors

When it comes to differences in terms of economic development, the Gini coefficient[1] is used to measure and analyse income inequalities. This indicator (also a component of the HDI) is one of the most commonly used measures of income inequality. It ranges between 0 and 100, where 0 indicates that income is shared equally among all people and 100 indicates the extreme situation where one person accounts for all income. In terms of average annual growth for the past decade, the GINI values in EU-27 countries (Figure 4) are consistent with the HDI ones and thus, they also outline consistent gaps between traditionally more developed economies in the North and West and the new member state in the East.

However, the “new” smaller member states in the centre of the EU (Czechia, Slovakia and Slovenia) registered less inequalities than Lithuania (35.5), Italy (35.2) and Latvia (34.5), as well as than the eastern most members, Romania (40.3) and Bulgaria (34.8) who have registered the highest income inequalities at EU-27 level. Moreover, in the EU-27. the overall lowest levels of income inequality were seen in Slovenia and the Czech Republic (although both countries are traditionally from the CEEc group) with Gini index values below 25. Furthermore, in terms of average annual growth, the Mediterranean countries in the southern part of the EU have registered significant increase of income inequalities.

Apart from income inequalities, *labour market conditions* can also contribute to disparities in human capital (FiBS, 2020). Countries with stronger job opportunities, higher wages, and better working conditions tend to attract and retain skilled individuals, enhancing their human capital. Conversely, countries with limited job prospects or brain drain phenomena may experience a depletion of human capital as skilled workers seek opportunities elsewhere.

[1] GINI Coefficient measures income distribution across a population and it ranges from 0 (or 0%) to 1 (or 100%), with 0 representing perfect equality and 1 representing perfect inequality. Values greater than 1 are theoretically possible due to negative income or wealth. Foe further information regarding the GINI Coefficient, please visit: https://unstats.un.org/sdgs/report/2020/goal-10/

Figure 4. Evolution of Income Inequalities in the EU-27 (2010-2022)

Source: Author's representation based on data provided by UNDP (2023)

Furthermore, a very important issue that the EU takes very seriously is the youth unemployment. Generally, the youth unemployment rate represents the percentage of unemployed individuals between the ages of 15 and 24 in the total labour force. According to Eurostat (2021), the EU average youth unemployment rate was 15.6%. However, there were significant variations among member states. The lowest rates in the EU were registered in Netherlands (6.6%), Czech Republic (8.3%), Germany (8.5%), Malta (9.1%), and Austria (9.3%).

These countries have relatively lower rates of youth unemployment compared to the EU average. At the other end of the spectrum, 2021, the countries with the highest youth unemployment rates in the EU were Greece (35.4%), Spain

(32.8%), Italy (28.6%), Sweden (24.1%), and Croatia (24.0%). These countries have been grappling with persistently high rates of youth unemployment, which can be attributed to various factors including economic conditions, labour market structures, and youth-specific challenges. To cope with these challenges, the EU has implemented various youth employment initiatives and programs to address youth unemployment. The (reinforced) Youth Guarantee, for example, aims to ensure that young people receive a good-quality offer of employment, education, or training within four months of becoming unemployed or leaving formal education.

Moreover, disparities in human capital are not only present at the national level but can also exist within regions of a country. Urban centres often concentrate higher levels of human capital due to better access to educational institutions, job opportunities, and resources. In contrast, *rural and peripheral regions* may face challenges in accessing quality education, training, and employment opportunities, resulting in lower human capital levels.

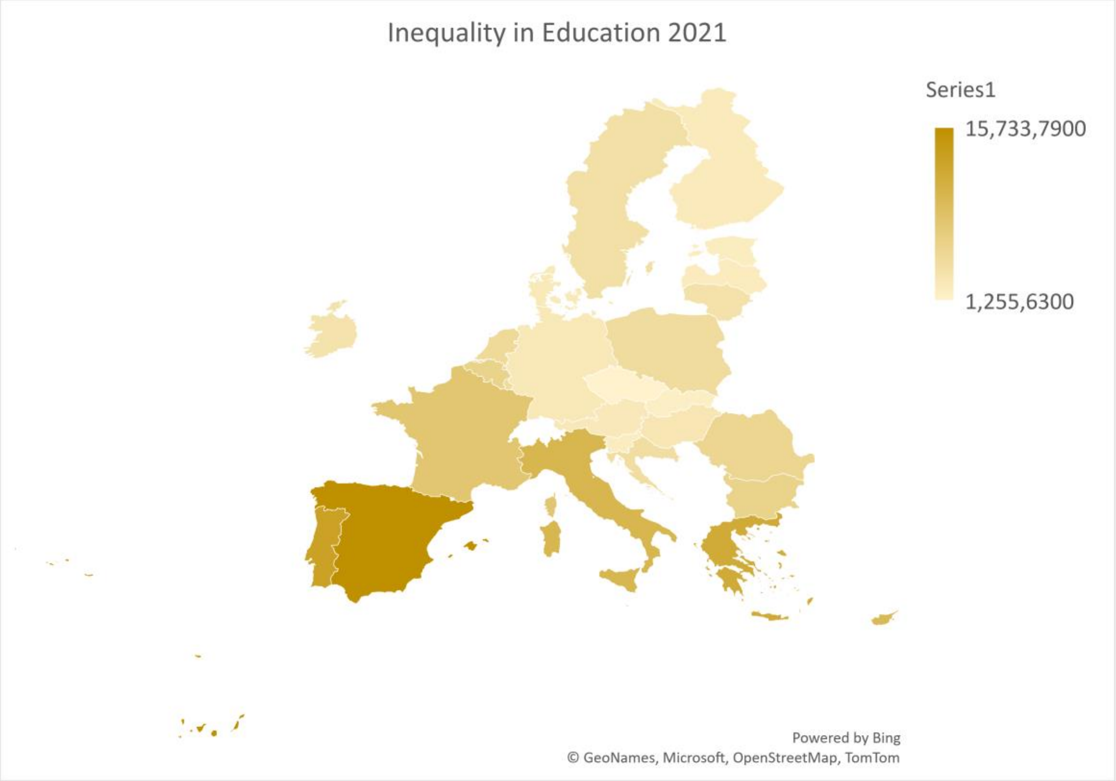
Gross Domestic Product (GDP) per capita is a commonly used indicator to assess regional economic disparities. According to Eurostat (2022), the regions with the highest GDP per capita in the EU include Luxembourg, Hamburg (Germany), and Brussels-Capital Region (Belgium). On the other hand, some regions in Eastern Europe and Southern Europe have lower GDP per capita compared to the EU average. For example, regions such as Severozapaden (Bulgaria), Nord-East (Romania), and Severen tsentralen (Bulgaria) have significantly lower GDP per capita compared to EU average. In this regard, The EU has implemented various programs and initiatives, such as the Cohesion Policy, to address these disparities and promote regional development.

Educational factors

Variations in the quality and structure of education systems among member states contribute to disparities in human capital. Some countries have well-established and adequately funded *education systems* that prioritize high-quality primary, secondary, and tertiary education. In contrast, others face challenges such as inadequate resources, outdated curricula, and limited access to educational opportunities, leading to lower levels of human capital.

Educational inequality refers to disparities in access to and quality of education among different groups within a society; it is usually measured by the education Gini index and is negatively associated with average years of schooling, implying that countries with higher educational attainment are more likely to achieve equality in education than those with lower attainment.

Figure 5. Education inequality in the EU-27



Source: Author's representation based on data from The World Bank (2023)

At European level (Figure 5) it is clear that the education systems are fairly different from one country to another. Whereas the northern and central European countries seem to have lower education inequality, the Mediterranean states, along with France, Romania and Bulgaria, highlight more education inequalities. In this regard, the level of *investment in education* significantly impacts human capital development. Countries with higher investments in education, including infrastructure, teacher training, and educational materials, tend to have higher levels of human capital. Insufficient investment in education limits access to quality education, resulting in lower skills levels and weaker human capital.

Disparities in *research and development (R&D) investment* and innovation capacity contribute to differences in human capital among member states. Countries with robust R&D ecosystems, research institutions, and innovation-driven industries tend to have higher levels of human capital. These countries foster a culture of research, innovation, and knowledge transfer, enabling individuals to acquire cutting-edge skills and contribute to economic growth. Research and Development Expenditure: R&D expenditure is an important indicator of a country's commitment to innovation.

Eurostat data from 2021 shows that the EU average stood at 2.27%, in terms of R&D expenditure as a percentage of GDP, having as top EU member states, countries like Sweden (3.35%), Belgium (3.22%), Austria (3.19%), and Germany (3.13%). These countries have consistently invested a significant proportion of their GDP in research and development activities. Conversely, the countries that invest least in research and development are the new member states in the east, with Romania (0.47%), Latvia (0.69%) and Bulgaria (0.77%), scoring way below EU average.

Moreover, in terms of innovation, the EU has developed a *European Innovation Scoreboard* (EIS) that provides an assessment of innovation performance in EU member states. According to the 2021 EIS, the top performers in terms of innovation in the EU were Sweden, Finland, Denmark, and the Netherlands. These countries consistently rank high in areas such as research and development, intellectual assets, and innovation outputs. Based on their scores, EU countries fall into four performance groups: Innovation leaders, Strong innovators, Moderate innovators and Emerging innovators.

- Sweden continues to be the best performer in the EU. Other *Innovation Leaders* are Finland, Denmark, the Netherlands, and Belgium.
- Ireland, Luxembourg, Austria, Germany, Cyprus, and France are *Strong innovators*, performing above the EU average.

- Estonia, Slovenia, Czechia, Italy, Spain, Portugal, Malta, Lithuania, and, Greece are *Moderate innovators*.
- Hungary, Croatia, Slovakia, Poland, Latvia, Bulgaria and, Romania are *Emerging Innovators*.

The quality of education and research, as a pre-requisite for a strong human capital can also indicated by the *number of patent applications filed*, as an indicator of a country's innovative activity. According to the European Patent Office and Eurostat, the EU total number of patent applications filed in 2022 was 67,500 most of which came from Germany (24,684 applications), France (10,900 applications), and the Netherlands (6,806 applications).

These countries demonstrate a significant level of innovation and technological advancement. Conversely, most of the member states in the CEE registered less than 100 patents, with Latvia (22), Croatia (32), Cyprus (42), Bulgaria (45) and Romania (46), filing the least patents. The disparities among EU's western and eastern members is extremely high in terms of innovation. As such, the most developed economies in the west have robust research ecosystems and contribute significantly to scientific knowledge, whereas the member states in the east invest very little in their R&D and consequently have significantly less results.

What is the east-west division in the EU in terms of human capital?

Overall, there can be identified consistent disparities in terms of quality of education and research innovation across EU member states, which generally outline a pattern of *east-west division*, consistent as well with their economic development.

Economic Development and Opportunities: Western EU members generally have higher levels of economic development and more diverse economies. This often translates into a wider range of employment opportunities, higher wages, and better overall living standards. The economies of Western EU members are often characterized by advanced industries, services sectors, and innovation-driven enterprises. Eastern EU members have made significant progress in economic development since joining the EU, but the levels of economic development and opportunities may vary. Some Eastern EU members have seen substantial economic growth, attracting foreign direct investment and developing competitive industries (like Estonia, Slovenia, Czechia or Poland). However, others may face challenges related to economic restructuring, regional disparities, and lower average incomes compared to Western EU members (like Bulgaria, Romania or Hungary).

Education systems: *Western EU members*, such as Germany, France, the Netherlands, and the *Nordic countries*, often have well-established and highly regarded education systems. They have a long tradition of investing in education and have universities and research institutions that are globally recognized. These countries tend to perform well in international education rankings. *Eastern EU members*, including countries like Bulgaria, Romania, and some Baltic states, have undergone significant educational reforms since joining the EU. While efforts have been made to improve education quality, some challenges remain, including disparities in infrastructure, resources, and educational outcomes. However, there are notable universities and research institutions in these countries that could contribute to research and innovation, should there be consistent efforts and strategies to have targeted investments in them.

Investments in R&D: *Western EU* members generally allocate higher levels of funding for research and development. Countries such as Germany, France, and Sweden have a strong focus on research and innovation and invest significantly in R&D activities. These countries have well-established research institutions and collaborate extensively with industry and academia. *Eastern EU members* have typically faced challenges in terms of R&D investment. However, efforts have been made to increase their R&D spending in recent years. These countries have been working on improving research infrastructure and establishing networks and partnerships with other EU members to enhance their research capabilities, but are still lagging behind.

International Collaboration: *Western EU members* often have stronger networks and collaborations with international partners, including leading universities and research institutions, but also business actors and government institutions from around the world. They benefit from established connections, joint research projects, and the exchange of knowledge and expertise with global partners. *Eastern EU members* have been working to enhance international collaboration in research and education. They have increasingly participated in EU-funded research programs and have formed partnerships with institutions in other EU member states and beyond. However, the partnerships with other actors, such as private sector or government institutions are generally lacking, despite various efforts to strengthen cooperation and benefit from cross-border research initiatives.

It can be noted that these observations are based on general trends and may not apply uniformly to all countries within each region. The EU places a strong emphasis on promoting cohesion and reducing disparities among its member states, including supporting human capital development. Subsequently, the EU has recognized the importance of addressing human capital disparities among member states. Various EU programs and policies, such as the European Structural and Investment Funds aim to support education, training, and research initiatives in both Western and Eastern EU members to foster human capital development and enhance opportunities for all citizens

These funds aim to support investment in education, skills development, and research and innovation, particularly in regions with lower levels of human capital. Additionally, programs like the above-mentioned Erasmus+ and the European Social Fund support mobility, educational exchanges, and skills development, fostering a more inclusive and equitable distribution of human capital across the EU.

4. The critical role of human resources in promoting economic resilience

Overall, disparities in human capital among EU member states stem from variations in education systems, investment in education, research and innovation capacities, labour market dynamics, and regional disparities. By narrowing the gaps in human capital, the European Union should foster inclusive and sustainable economic development across its member states and make them more resilient in front of shock or disruptions. Generally, economic resilience refers to the ability of an economy to withstand and recover from shocks, disruptions, and challenges, while maintaining stable growth and development. To this end, human resources play a crucial role in promoting economic resilience within the European Union (EU).

Why should the EU take further steps to address these disparities and foster its resilience?

Human capital is a key determinant of a country's ability to respond and adapt to economic shocks and challenges. Therefore, a strong human capital base is essential for building *economic resilience*. By investing in education, skills development, health, and labour market participation, countries can enhance their human capital and strengthen their capacity to withstand and recover from economic shocks and challenges.

As such, the human resource plays a vital role in determining the economic resilience of the European Union (EU) in the face of various shocks and challenges. Recent events such as the *war in Ukraine, the Covid-19 pandemic, and the financial crisis of 2008* have underscored the importance of a skilled and adaptable workforce in *maintaining stability and promoting recovery*. For instance, the war in Ukraine, coupled with geopolitical tensions, has had significant economic implications for the EU (Jenkins, 2023). The conflict has disrupted trade flows, created uncertainties, and strained diplomatic relations. In such a situation, human resources become crucial in managing the economic impact (KPMG, 2023). A skilled workforce with diverse expertise allows for the adaptation of industries, identification of alternative markets, and the development of innovative solutions to mitigate the negative consequences of the conflict. By investing in education, skills development, and fostering a culture of continuous learning, the EU can equip its workforce to navigate through such geopolitical shocks and foster economic resilience.

Furthermore, the Covid-19 pandemic has been an unprecedented global shock that has affected all EU member states. It has disrupted supply chains, forced businesses to close, and caused widespread job losses. The pandemic has highlighted the need for a resilient and agile workforce capable of adapting to new working conditions, digital technologies, and remote collaboration (Abraham and Vosta, 2022). Human resources have also played a crucial role in maintaining essential services, developing digital infrastructure, and facilitating the shift to remote work and online business operations. Moreover, investing in healthcare professionals and enhancing healthcare systems has been vital in ensuring the resilience of the EU's public health response (FiBS, 2020). Strengthening human capital through investments in healthcare, digital literacy, and reskilling initiatives will be key to building resilience against future health crises and ensuring economic continuity.

The financial crisis of 2008 has also exposed vulnerabilities in the EU's financial sector and had far-reaching economic consequences. To cope with this shock, human resources were instrumental in navigating the aftermath of the crisis, as skilled professionals were needed to restore confidence, reform financial institutions, and implement regulatory measures (Correia et al., 2009). The crisis also underscored the importance of financial literacy and risk management skills among individuals and businesses. By investing in financial education and fostering a culture of prudent financial practices, the EU could enhance the resilience of its financial system and reduce the impact of future financial shocks.

Consequently, the shocks experienced by the European Union, such as the war in Ukraine, the Covid-19 pandemic, and the financial crisis of 2008, have emphasized the *critical role of human resources in promoting economic resilience*. A skilled and adaptable workforce is essential for navigating through disruptions, identifying new opportunities, and implementing innovative solutions. To strengthen economic resilience, the EU should prioritize investments in education, skills development, healthcare, digital literacy, and financial literacy. By nurturing human capital, the EU can build a resilient and agile workforce capable of withstanding shocks, driving economic recovery, and fostering sustainable growth in the face of future challenges. However, an additional factor that hinders EU's resilience to such shocks represents the disparities between the Union's countries and regions. In this regard, to further address disparities, it is crucial to prioritize targeted investments in education and skills development in regions with lower human capital levels. Enhancing access to quality education, vocational training, and lifelong learning opportunities can help bridge the gaps (Biedka et al., 2021). Moreover, promoting collaboration between member states, sharing best practices, and facilitating knowledge exchange can contribute to reducing disparities and promoting equal opportunities for all citizens within the EU.

5. Policy recommendations regarding the role of human capital in enhancing economic resilience within the EU

Rationale: human capital represents a critical factor in building resilient and sustainable regional economies & Aim: this policy recommendation aims to strengthen human capital across all regions, fostering economic resilience, reducing disparities, and promoting sustainable development.

According to all the evidence exposed above, it is clear that Europe experiences significant regional disparities in terms of human capital development. Despites EU's many initiatives and efforts, the disparities still weigh heavily on the union's balanced development, having the weakest performers as the most vulnerable in front of upcoming shocks. In this regard, strengthening human capital in all countries and regions is crucial to ensure that they have the necessary skills and capabilities to drive economic growth and withstand economic shocks.

On the one hand, by equipping individuals with relevant and adaptable skills, investments in education and skills development contribute to *enhancing the resilience of regional economies*. Skilled workers are better prepared to navigate economic changes, seize new opportunities, and contribute to sustainable economic growth. On the other hand, human capital is a key driver of competitiveness in the global economy. By investing in education, skills development, and lifelong learning, the EU can *enhance its overall competitiveness* and ensure that its workforce remains adaptable and resilient to technological advancements and market changes.

What further Policy Actions should the EU take?

1. *More targeted investment in education* → Increase funding for education at all levels, with a specific focus on regions with lower educational attainment; this can

include expanding access to early childhood education, improving primary and secondary education systems, and enhancing vocational and technical training programs. First and foremost, targeted investments in education and skills development can help bridge these disparities, ensuring that all countries and regions have equal access to quality education and training opportunities. Moreover, the EU could focus on strengthening the quality and relevance of vocational education and training (VET) programs across the EU countries by fostering closer collaboration between educational institutions, industry stakeholders, and social partners to ensure that VET programs align with the skills needs of various sectors; this way, the EU will ensure that it promotes work-based learning and apprenticeship programs to bridge the gap between education and employment.

2. *Continue to invest in skills development and Lifelong Learning Programs* (LLP) → Establish a comprehensive EU-wide skills development strategy that emphasizes lifelong learning. This strategy should focus on promoting digital skills, entrepreneurial skills, and other key competencies needed in the modern economy. In this regard, enhanced support for the development of accessible and affordable LLPs shall enable individuals to continually upgrade their skills. As such, these programs should provide opportunities not only for learning skills, but especially for upskilling, reskilling, and retraining, in order to ensure that the workforce remains adaptable and resilient to changing economic needs.

3. *Foster closer collaboration between educational institutions, governments and private sector* → Foster stronger collaboration between regional authorities, businesses, and educational institutions (universities, colleges, vocational training centres); this collaboration can help align educational programs with the skills needs of industries and enhance the relevance and effectiveness of education and training initiatives. In this regard, the EU shall continue to support and encourage cross-border mobility and exchange programs in order to facilitate the transfer of knowledge, skills, and best practices. Enhance initiatives such as Erasmus+ and the European Solidarity Corps to promote learning experiences, cultural understanding, and skills acquisition among young people.

4. *Enhance focus on entrepreneurship and innovation education* → Integrate entrepreneurship and innovation education into curricula across all educational levels. Such an approach could help equip individuals with the necessary entrepreneurial mindset and skills to contribute to economic diversification,

business creation, and innovation. In this regard, the European decision-makers should design and promote EU-wide initiatives to support entrepreneurship and innovation; this includes providing funding, mentoring, and incubation support for start-ups and small and medium-sized enterprises (SMEs), as well as facilitating access to finance and promoting collaboration between academia, research institutions, and industry.

5. *Invest in digital skills development* → Prioritize the development of digital skills across all sectors and industries within the EU countries and regions. Such an endeavour should include investments in digital literacy programs, training on emerging technologies, and support for digital transformation initiatives across all age groups. Digital skills are increasingly essential for competitiveness and resilience in the modern economy, especially in terms of remote work. As such, the EU should foster technology adoption in businesses and industries through support programs, subsidies, and incentives, ensuring that individuals and organizations can leverage digital technologies for economic resilience and competitiveness.

6. *Concentrate on regional talent attraction and retention* → Implement measures to attract and retain skilled individuals in regions facing talent outflows. The EU could include incentives for skilled workers to relocate to and remain in these regions, such as tax incentives, affordable housing initiatives, and quality of life improvements. More specifically, in order to encourage regional cooperation and collaboration to address disparities in human capital development, EU's policy actions could focus on promoting knowledge sharing and best practices among regions, facilitating partnerships between stronger and weaker regions, and providing targeted investment and support to regions with lower human capital to enhance their economic resilience.

In order to ensure the successful implementation of these key policy actions, the EU should also establish robust mechanisms for monitoring and evaluating their impact, including tracking educational outcomes, skills development, entrepreneurship rates, digital adoption, and regional economic indicators. Regular assessment will allow policymakers to track progress, to make informed policy decisions, identify areas for improvement, and ensure the effectiveness of the policy measures.

6. Conclusions – What is next for EU's human capital?

To sum up, human capital plays a multifaceted role in strengthening regional economic resilience; it promotes adaptability, innovation, productivity, collaboration, and competitiveness. By taking the above-mentioned policy actions, the European Union can foster the development of a highly skilled and adaptable workforce across all regions, contributing to enhanced economic resilience, reducing disparities, and promoting sustainable growth and competitiveness in the EU as a whole. As such, to strengthen regional economic resilience through human capital, policymakers should prioritize investments in education and skills development, promote entrepreneurship and innovation ecosystems, enhance collaboration between academia and industry, support lifelong learning, and create an environment that attracts and retains talent.

Apart from these specific policy actions that the EU can take, there are additional specific trends to have in mind when drawing and implementing measures to foster and enhance human capital. The future of human capital in EU countries holds, however, both opportunities and challenges.

First, future trends in human development may increasingly focus on *sustainability and environmental considerations*. The EU is already committed to addressing climate change, reducing carbon emissions, and transitioning to renewable energy sources and should continue emphasizing the importance of environmental sustainability alongside traditional development factors. Green Transition: The EU is committed to achieving climate neutrality and transitioning to a sustainable and green economy. This transition will require significant investments in renewable energy, circular economy practices, and sustainable technologies. Consequently, there will be a growing demand for workers skilled in green technologies, renewable energy, sustainable agriculture, and environmental management.

Second, ongoing *technological advancements* can have a profound impact on future human capital development trends. EU countries are at the forefront of technological innovation, which can lead to improved healthcare, education, and overall living standards. The integration of advanced technologies will definitely play a significant role in shaping the future of highly qualitative human capital. The digital revolution is expected to continue transforming the global economy and the nature of work. EU countries will need to adapt and equip their workforce with digital skills to remain competitive and take advantage of emerging opportunities in sectors such as artificial intelligence, automation, and data analytics. In this regard, EU investments in digital education and upskilling programs will be crucial to foster a digitally capable workforce. Moreover, the evolving job market and technological advancements emphasize the importance of *lifelong learning*. EU countries need to foster a culture of continuous learning and provide opportunities for upskilling and reskilling throughout individuals' careers. Flexible learning pathways, accessible education, and training programs will play a vital role in ensuring the adaptability and employability of the workforce.

Third, addressing *social inequality* and promoting inclusive growth are likely to remain important considerations for future human development trends. EU countries shall continually work to reduce disparities in income distribution, education access, and healthcare outcomes. Policies aimed at narrowing social gaps can positively impact future quality of human capital. Up to date, the EU has been committed to promoting social inclusion and combating inequalities. Ensuring equal access to quality education, regardless of socioeconomic background or geographic location, is vital. Moreover, fostering diversity and inclusion in the workforce, promoting gender equality, and reducing gaps in educational attainment will contribute to a more equitable and inclusive society.

Fourth, *demographic changes*, such as an aging population and migration patterns, will majorly influence human capital trends. EU countries are already experiencing demographic shifts, which may impact factors such as healthcare systems, labour markets, and social welfare. These changes can affect future human capital development and require tailored policies to ensure sustainable development. It's important to note that the specific trajectory of human capital development in EU countries will depend on additional various factors, including domestic policies, economic conditions, and regional dynamics. Many EU countries face aging populations and declining birth rates. This demographic shift brings challenges such as a shrinking workforce and increasing pressure on social security systems. In this regard, investing in education, healthcare, and social policies that support active aging, encourage workforce participation, and address the needs of an aging population will be crucial for the EU to sustain its economic growth and social well-being.

Last, *globalisation and increased mobility* present opportunities for EU countries to attract skilled workers and benefit from diverse perspectives. However, managing the mobility of workers and addressing brain drain in certain regions will be important. Balancing the benefits of talent mobility with the need to retain skilled workers domestically will be a key consideration.

Consequently, the future of human capital in the EU countries depends on proactive policies and investments that address these challenges and seize opportunities. By focusing on digital skills, sustainable development, lifelong learning, social inclusion, and effective labour market policies, EU countries can foster human capital development that drives economic growth, social cohesion, and resilience in the face of future changes.

REFERENCES

Abraham, J., & Vosta, M. (2022), Impact of the COVID-19 Pandemic on EU Convergence, *Journal of Risk and Financial Management*, 15(9), 384; https://doi.org/10.3390/jrfm15090384

Acemoglu, D., & Angrist, J. D. (2001). How Large Are Human-Capital Externalities? Evidence from Compulsory-Schooling Laws, National Bureau of Economic Research (NBER), https://doi.org/10.1086/654403

Barro, R. J., & Sala-i-Martin, X. (1995), *Economic Growth*, ISBN 0-262-02553-1, The MIT Press, Cambridge, Massachusetts / London, England.

Biedka, W., Herbst, M., Rok, J. & Wójcik, P. (2021), The local-level impact of human capital investment within the EU cohesion policy in Poland, *Regional Science*, 101(2):303-325, DOI: https://doi.org/10.1111/pirs.12648

Boschma, R., & Fritsch, M. (2009). Creative Class and Regional Growth: Empirical Evidence from Seven European Countries. Economic Geography, 85(4), 391-423.

Cappelli, R., Montobbio, F., & Morrison, A. (2021) Unemployment resistance across EU regions: the role of technological and human capital, *Journal of Evolutionary Economics*, 31(1): 147–178.

Correia, T., Dussault, G. & Pontes, C. (2015). The impact of the financial crisis on human resources for health policies in three southern-Europe countries, *Health Policy*, 119(12):1600-1605, DOI: 10.1016/j.healthpol.2015.08.009

Crescenzi, R., Gagliardi, L., & Percoco, M. (2013). The Bright Side of Social Capital: How 'Bridging' Makes Italian Provinces More Innovative. *Journal of Economic Geography*, 13(3), 537-558.

Hanushek, E. A., & Woessmann, L. (2008), The Role of Cognitive Skills in Economic Development. Journal of Economic Literature, 46(3), 607-668.

Huang, X. (2021) Immigration and economic resilience in the Great Recession. *Urban Studies* 58(9): 1885–1905.

Jenkins, B. M. (2023), Consequences of the War in Ukraine: The Economic Fallout, RAND Corporation. Objective Analysis, effective Solutions, retrieved from https://www.rand.org/blog/2023/03/consequences-of-the-war-in-ukraine-the-economic-fallout.html

Martini, B. (2020). Resilience, resistance and recoverability, regional economic structure and human capital in Italy. Are they related? Applied Econometrics and International Development 20, Euro-American Association of Economic Development: 47–62.

Martin, R. & Sunley, P. (2015), On the notion of regional economic resilience: conceptualization and explanation, *Journal of Economic Geography* 15(1): 1–42.

Masik, G., & Rzyski, S. (2014) Resilience of Pomorskie region to economic crisis. *Bulletin of Geography. Socio-Economic Series* 25(25): 129–141.

Palekiene, O., Simanaviciene, Z., & Bruneckiene, J. (2015) The application of resilience concept in the regional development context, *Procedia-Social and Behavioral Sciences*, 213: 179–184.

Pizzuto, P. (2020) The role of regional competitiveness in shaping the heterogeneous impact of the Great Recession, *Regional Science Policy and Practice* 12(2): 267–290.

Reports:

European Commission (2023), *European Year of Youth 2022*, retrieved from: https://youth.europa.eu/year-of-youth_en#content

FiBS (2020), Youth unemployment in times of crisis in the EU27, FiBS Research Institute for Education and Social Economics, Berlin, retrieved from: https://www.fibs.eu/fileadmin/user_upload/Literatur/FiBS_Forum_072_Final_FiBS_Youth_Unemployment_in_times_of_Crises_200724_Final.pdf

KPMG (2023), The Economic Impact of the Russia-Ukraine War, retrieved from: https://kpmg.com/de/en/home/insights/2022/05/the-economic-impact-of-the-russia-ukraine-war.html

OECD (2023), *Productivity, human capital and educational policies*, retrieved from https://www.oecd.org/economy/human-capital/ (accessed in May, 2023).

The World Bank (2023), *The Human Capital Project*, retrieved from: https://www.worldbank.org/en/publication/human-capital (accessed in March 2023).

United Nations Development Program (UNDP) (2023), *Human Development Index Report*, retrieved from: https://hdr.undp.org/data-center/human-development-index#/indicies/HDI

ABOUT

Jean Monnet Module on EU Interdisciplinary Studies:
Widening Knowledge for a more Resilient Union | EURES
PROJECT NUMBER – 621262-EPP-1-2020-1-RO-EPPJMO

The reasons laying behind the project are related to the harsh economic challenges the EU is currently facing, the youth being mostly affected by very high unemployment rates. Thus, encouraging academic debates on how can young population acquire more competences and ease its labour market integration may be the key for reviving European economy (a more resilient EU).

All activities proposed in the project have an interdisciplinary and multidisciplinary character: the events are aimed at specialists in various EU issues (regional development, health, European funding opportunities, methodological aspects); the target audience consists of students, teachers, researchers, broad public – having different profiles and professional backgrounds; the topics of the events organised (seminars, workshops, round tables) cover many perspectives: economic, social, political, medicine, engineering etc.

EURES project is coordinated by Ramona Tiganasu, researcher at Centre for European Studies

The Centre for European Studies (CES) is an interdisciplnary department within the Faculty of Law from Alexandru Ioan Cuza University of Iași, Romania and operates as a Jean Monnet Centre of Excellence in European Studies, from 2009.

CES's mission is to contribute to the development of the European dimension of education, to promote research and consultancy, information, documentation in the area of European studies and to, directly and indirectly, support the process of economic and social development in the North-East region of Romania.