European Research Studies Journal
Volume XXVII, Issue 4B, 2024

pp. 510-528

Competitiveness of EU Member States According to the Index Institute of Management Development

Submitted 06/10/24, 1st revision 25/10/24, 2nd revision 16/11/24, accepted 25/11/24

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Abstract:

Purpose: *The purpose of the research undertaken is to assess the degree of competitiveness of EU member states, taking into account the data published in the form of the IMD ranking, which measures the ability of EU economies to adapt digital technologies and the readiness to seek new applications of digital technologies as a key factor of economic transformation in industry, the public sector and wider social relations.*
Design/Methodology/Approach: *In order to assess the degree of competitiveness of EU member states, the research used data published in the form of the IMD ranking, which measures the ability of EU economies to adopt digital technologies, a comprehensive research approach was used. The first step was to conduct a review of the scientific literature. This was followed by collecting secondary data from a variety of source data. To assess the competitiveness of EU member states in terms of the ability of their economies to adapt digital technologies, the coefficient of determination (R^2), a measure to assess the fit of the regression function to empirical data, was used.*
Findings: *the analyses conducted indicate that the competitive position of EU member states as determined by the IMD report is correlated with the ranking of countries determined by the GDP per capita index. Analysis of the dynamics of changes in the IMD index and GDP per capita for EU member states confirmed that with the increase in GDP per capita there was an increase in the IMD index reporting the progress of digitization and innovation in the economy.*
Practical implications: *the article identifies the importance of the development of countries' economies as measured by the GDP indicator in the implementation of IT solutions resulting in the progress of digitization and innovation in the development of the economies of the studied countries. In addition, the article highlights the growing role of digitization in terms of sustainable development of EU countries.*
Originality: *The article presents the benefits of using the Institute of Management Development index in shaping the competitive advantage of EU member states.*

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Keywords: *IMD index, GDP, competitiveness.*

JEL classification: *D2, F3, F4, K2, M2.*

Paper type: *Research article.*

1. Introduction

The international competitiveness of an economy is defined as a country's ability to achieve the greatest possible benefits associated with the international distribution of capital and labor (Dorrego, 2013; Eurostat, 2010). The European Commission, in defining competitiveness, indicated that it is the ability of a country to achieve stable growth in GDP *per capita*, thereby ensuring a high standard of living for its citizens, the ability to perform certain jobs and reduce unemployment (Garelli, 2015; Grynia, 2020; Grosse, 2002).

A national economy is indicated as competitive in the international environment when the pace of development in the long term is evident under conditions of free trade and free flow of production factors (Graca-Gelert, 2015; Jóźwik *et al.*, 2012; Hajder and Górny, 2019). Competitiveness of EU member states is also defined as the ability to compete and increase the use of productive factors to improve the living conditions and welfare of EU citizens. Many definitions of competitiveness as an economic phenomenon related to the socio-economic development of a country are presented in the literature (Kagermann *et al.*, 2013; Kantanen, 2012; Aiginger and Vogel, 2015; Cocburn *et al.*, 2018; Piętak, 2017; Puślecki and Walkowski, 2010; Pruchniak *et al.*, 2020; Thalassinos *et al.*, 2023).

The International for Management Development (IMD) index provides a general snapshot of the factors that determine the level of competitiveness of an economy, taking into account the four categories of factors that determine the competitiveness of an economy with their division into five sub-factors that highlight different aspects of competitiveness. The IMD index contains 20 sub-indices (Rapacki and Próchniak, 2020; Kowalski, 2020).

The index pays explicit attention to distinguishing the quality of institutions through the quality and practices of legal institutions, competition regulations as well as a deeper analysis of the infrastructure sphere, and the quality of railroads, roads, ports and infrastructure investments, among others. Currently (2024), the IMD index is being developed for 67 countries.

The IMD ranking is based on measuring progress in three areas:

- knowledge, including the intangible infrastructure necessary for technology learning and research,
- technologies, quantifying the landscape of digital development in the economy,
- 'future readiness', examining the level of preparedness of the economy for the digital transformation.

The competitiveness index created by IMD - The World Competitiveness Yearbook is a competitive indicator against the Global Competitiveness Indicator – GCI. In the 1990s, these institutions published only one common indicator, however, as a result of methodological differences, different reports began to be produced. The IMD (International for Management Development) is a more useful indicator than the GCI, as it consists of components that correspond to individual elements of competitiveness analysis.

The IMD World Competitiveness Yearbook is a comprehensive annual report and global benchmark on country competitiveness. It provides comparative analysis and trends, as well as statistics and survey data based on extensive research. It analyzes and ranks countries according to how they manage their competencies to achieve long-term value creation.

Evaluating the competitiveness of a country's economy cannot be reduced to GDP and productivity alone, as the activities of businesses are significantly influenced by political, social and cultural factors.

Therefore, member countries should provide an environment characterized by efficient infrastructure, institutions and policies that encourage sustainable value creation by businesses (Tomaskovic-Devey, 1991). These values are measured and demonstrated in the IMD report.

IMD's competitiveness rankings underscore a long-term trend indicated in previous editions - each of the countries at the top of the rankings has a unique approach to competitiveness processes. The ranking provides a comprehensive description for 67 economies, selected on the basis of comparable international statistics and cooperation with local partner institutions, which contribute to the collection of survey data and ensure that all data is reliable, accurate and up-to-date.

The World Competitiveness Ranking is based on 334 competitiveness criteria selected as a result of comprehensive research using economic literature, international, national and regional sources and feedback from the business community, government agencies and researchers. The criteria are regularly reviewed and updated as new theory, research and data emerge and as the global economy develops (Tusińska, 2014; Thalassinos, 2008).

IMD World Competitiveness Online is a unique and comprehensive database on country competitiveness. It includes time series from the IMD World Competitiveness Yearbook, the leading annual report published by IMD since 1989, the IMD World Talent Ranking and the IMD World Digital Competitiveness Ranking.

A synthesis of all the indicators of the dimensions of competitiveness discussed is the index developed by the Institute of Management Development (IMD). During the Covid-19 pandemic, the sustainable dimension of competitiveness, which refers to the elimination of socioeconomic exclusion and the ecological effects of economic activity, becomes more important than before (Lew *et al.*, 2024).

One of the synthetic measures of sustainable competitiveness is the Social Progress Index (SPI). It takes into account three groups of factors, describing basic human needs, principles for achieving prosperity, and opportunities for personal development. The index does not include economic outcomes, such as economic growth rates, which allows a direct comparison of social progress and environmental progress without considering economic indicators.

The aim of the research undertaken is to assess the degree of competitiveness of EU member countries, taking into account data published in the form of the IMD ranking, which measures the ability of EU economies to adopt digital technologies and the readiness to explore new applications of digital technologies as a key factor for economic transformation in industry, the public sector and wider social relations. The IMD report ranks countries according to how they manage their competencies to achieve long-term value creation related to digital development.

The study verified two research hypotheses:

H1: The competitive position of EU member states as determined by the IMD report is correlated with the ranking of countries determined by GDP per capita.
H2: The competitiveness of the economically weakest EU member states as determined by the IMD report in 2010 and compared to the 2020 ranking has not improved significantly.

2. Source Material and Methods

The empirical material used in the study concerned the 27 EU member states, and the EU's position in relation to the world's leading economies was assessed. Figures were taken from reports by the Institute for Management Development (IMD), based in Lausanne, where it is calculated and published in the World Competitiveness Yearbook - a leading annual report released once a year (imd.org). GDP per capita values were assessed based on data published by Eurostat (European Commission 2020/2021). A comparative analysis of the competitiveness of EU member states based on the IMD rankings was carried out for 2010 and 2020.

To assess the competitiveness of EU member states in terms of the ability of EU economies to adapt digital technologies, the coefficient of determination (R^2) was used, which is a measure for assessing the fit of the regression function to empirical data. It informs what part of the variability of the explained variable Y (GDP per capita) was explained by the function of the explanatory variable X (IMD coefficient). The value of the coefficient of determination ranges from 0 to 1. A value of this coefficient closer to unity indicates a more accurate fit of the regression function to the empirical data.

Graphical methods were used for the analysis, compiling the basic characteristics: arithmetic mean, median, and maximum and minimum values.

3. Results and Discussion

The IMD World Competitiveness Yearbook 2010, 2020 report outlines the principles a country should follow to be competitive and maintain a high level of international competitiveness (Spicker, 1998; Talberth *et al.*, 2007). Among the most important principles are:

- creating a stable legal system,
- generating domestic savings and promoting domestic investment,
- creating an economic structure that is flexible to external action,
- creating the right conditions for foreign investment,
- investing in education,
- investing in infrastructure,
- reducing the wage gap.

The rules given allowed the following statements related to the value of the IMD index to be determined:

- a country, despite having a high national income, can be uncompetitive,
- a "poor" country with few resources can be competitive if it makes an effective transition process,
- international competitiveness should be studied in terms of hard and soft factors.

The hard factors listed are those that have a significant impact on the competitiveness of the economy and that can be analyzed in the short term. Soft factors, on the other hand, have to do with the ability to implement certain strategies as a result of proper management.

By observing the competitive process, it can be pointed out that soft factors are becoming increasingly important. Soft factors are difficult to define, despite their esoteric nature, in recent years they have gained considerable importance in models

that explain the economic development of countries (Thorbecke, 2013; Thumann, 2012).

The IMD 2020 report (imd.org) shows little change in the economies ranked in the top 10 compared to 2010. The US and Singapore maintained their positions and several countries swapped places. At the top of the ranking were economies with the ability to develop and effectively utilize digital talent, an effective and friendly regulatory environment, and the ability to quickly adapt and implement new technologies known as '*Future Readiness*.

Innovation, digitization, social benefits and social cohesion are key to economic performance in the 2020 rankings, led by: Switzerland, Sweden, Denmark, the Netherlands. In the IMD 2020 competitiveness ranking, the top-performing EU economies are characterized by varying degrees of investment in innovation, diverse economic activities supporting public policies (Valenia, 2018; Kucznik 2019).

The competitiveness of EU countries in 2020 according to the IMD 2020 ranking was at a higher level as in the 2010 ranking in terms of digital technology adaptation and readiness to seek new applications of digital technologies as a key factor for economic transformation in industry, the public sector and broader social relations.

Between 2010 and 2020, an increase in the IMD index was evident in all EU member states, signifying an increase in the adaptation of digital technologies and readiness to seek new applications of these technologies. The index ranges in value from 0 to 100.

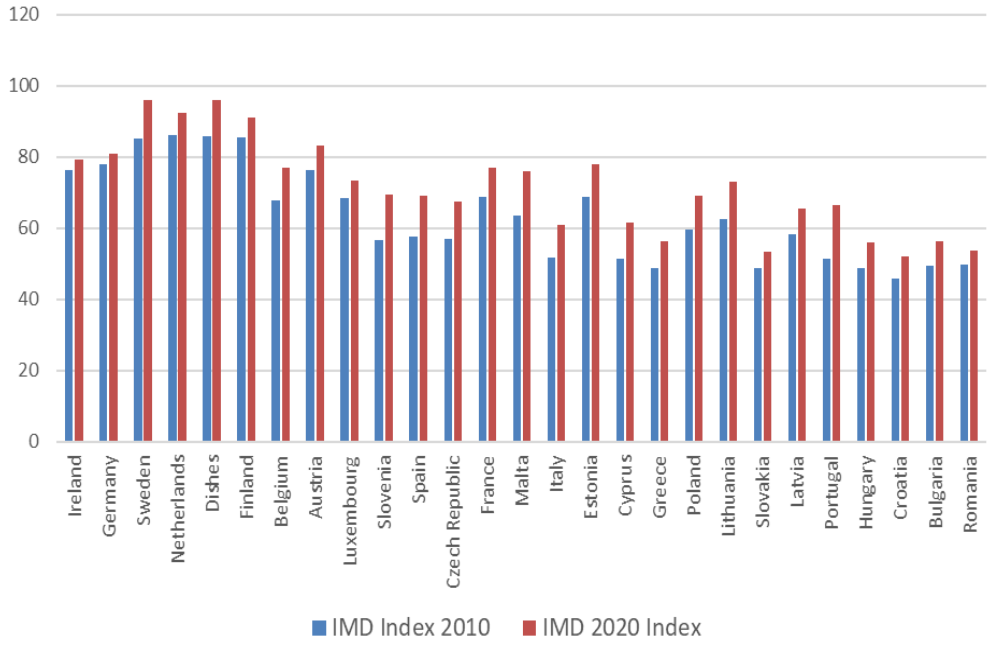
The higher the value, the higher the competitiveness of a given economy (Renda, 2014; Różanski, 2020). In 2020, the highest value occurred in Denmark (96.013), Sweden (96.016), the Netherlands (92.567), Austria (83.127), while the lowest value occurred in Croatia (52.045), Slovakia (53.261), Romania (53.668) and Bulgaria (56.295) (Figure 1).

Data published for 2010 as well as for 2020 IMD rankings place Poland 18th in the EU in terms of economic competitiveness - ahead of Latvia, Italy, Hungary, Bulgaria, Greece, Romania, Slovakia and Croatia.

The European leaders in the competitiveness of digital adaptation are the Nordic countries. Three of them - Denmark, Sweden and Finland - are among the top five in the ranking.

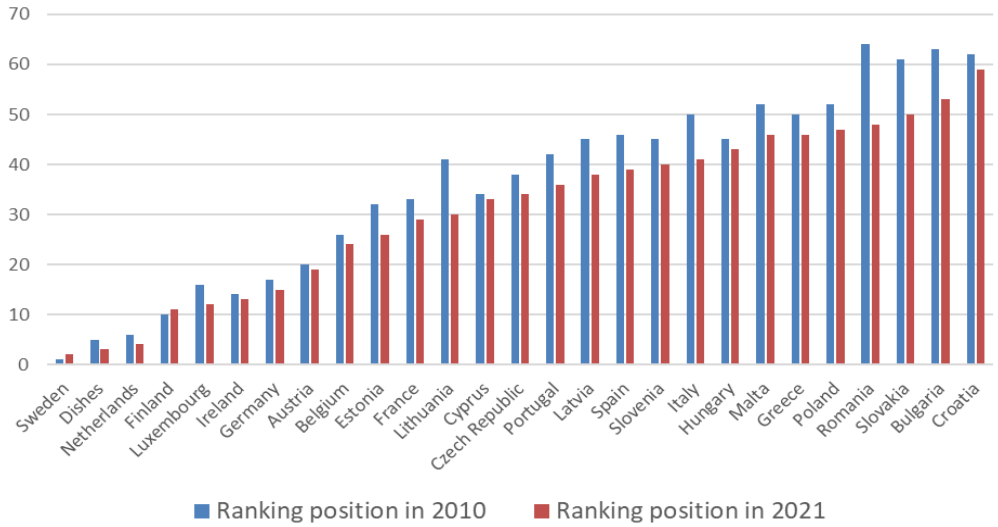
The Netherlands and Ireland are also among the most competitive European economies. Among the member states, Romania, Croatia, Bulgaria and Slovakia were the worst ranked (Figure 2).

Figure 1. *IMD competitiveness index of EU member states in 2010 and in 2020*



Source: *Own work based on Ranking out of 67 countries, World Competitiveness Ranking, IMD, https://www.imd.org/centers/wcc/world-competitiveness-center/rankings/world-competitiveness-ranking/rankings/wcr-rankings/#_tab_Rank.*

Figure. 2. *IMD ranking position of each EU member state in 2010 and in 2021*



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According to IMD's (imd.org) 2021 ranking of digital technology adoption and readiness to explore new applications of digital technologies as a key driver of economic transformation in industry, the public sector and broader social relations, Switzerland ranks highest, followed by the United States, and Germany (ranked 17th globally) and China (ranked 20th globally). Poland, with 39th position in the world ranking, is ahead of only India and Ukraine in this group.

GDP or GDP per capita is not a perfect measure of broad economic processes. Hence, using only this indicator in assessing the economic situation of the population and its changes over time in one or more countries is completely unjustified (Lerro and Schiuma, 2009; Markusen and Strand, 2009). In this situation, it becomes reasonable to include other indicators in the assessment of the situation of the population in addition to GDP and GDP per capita. One of the most important is the Human Development Index (HDI) promoted in the United Nations Development Program's Global Human Development Reports.

The GDP *per capita* index used in the presented analysis is only a rough and indicative measure of the standard of living. This is because its value depends on many different factors, not only economic. In the literature (Tomaskovic-Devey, 1991; Tusińska, 2014; Valenia 2022), several measures of the level of socio-economic development alternative to GDP *per capita* have been defined.

The primary measures of income competitiveness refer to gross domestic product (GDP), most often GDP *per capita* determined on the basis of purchasing power parity, which is one of the commonly used macroeconomic measures. This indicator has long remained a marker of the division between developed and developing countries, showing polarization in terms of socioeconomic development (Pilarska, 2017). At the same time, GDP is the most widely used measure of the impact of the crisis on countries' economies.

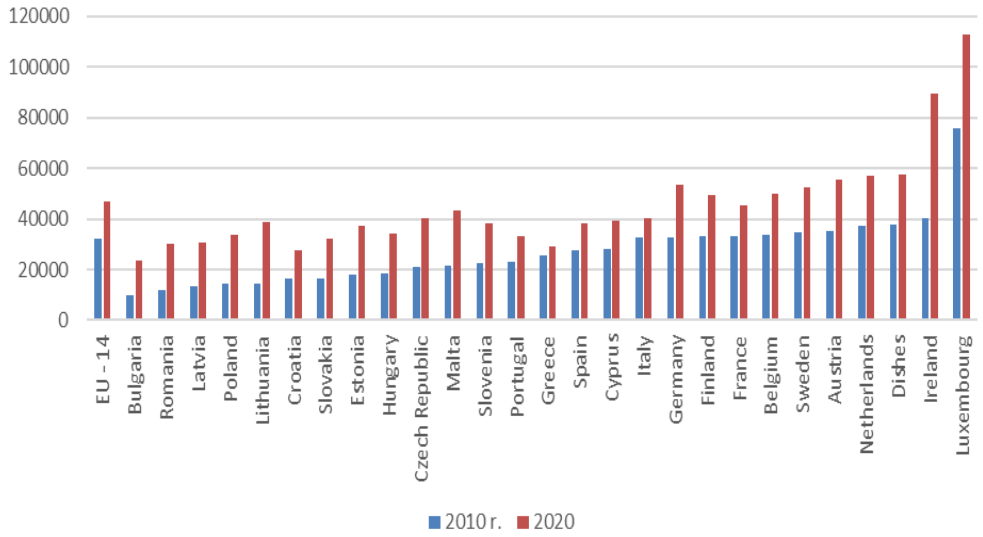
The European Union comprises 27 countries of widely varying size and economic potential. The four largest countries in terms of population and output - Germany, France, Italy and Spain - in the 2020 ranking. - comprise 57% of the total population of the EU-27 and produce 63% of the total GDP calculated at market exchange rates (MER) or 60% at purchasing power parity (PPS).

All 14 countries that are now part of the EU and counted as part of the Western European area (EU-14) represent 77% of the total population and produce 89% of total GDP at RKW and 82% in the case of PPS. In contrast, the 13 new member states that joined the EU in 2004, 2007 and later (11 countries from Central and Eastern Europe plus Cyprus and Malta) represent 23% of the total population, but produce only 11% or 18% of total EU GDP, respectively.

In this significant asymmetry between the "old core" of the Union and the new member states, one must take into account the place of Poland, which ranks between

Latvia and Lithuania. Germany, France, Italy, Spain had the highest GDP ranking, while Malta, Cyprus, Estonia and Latvia had the lowest (Figure 3).

Figure 3. *Ranking of EU-27 countries in terms of GDP per capita by PPP (USD)*



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The data in Figure 3 shows that in 2020 the average GDP per capita in the European Union countries (EU-27), calculated according to the PPP, was 43,616 USD, and in the countries belonging to the Union before enlargement (EU-14) - 46,864 USD. The level of income in the EU member countries varies remarkably. The leader in terms of GDP per capita is Luxembourg (112,875 USD), followed by Ireland (89,383 USD).

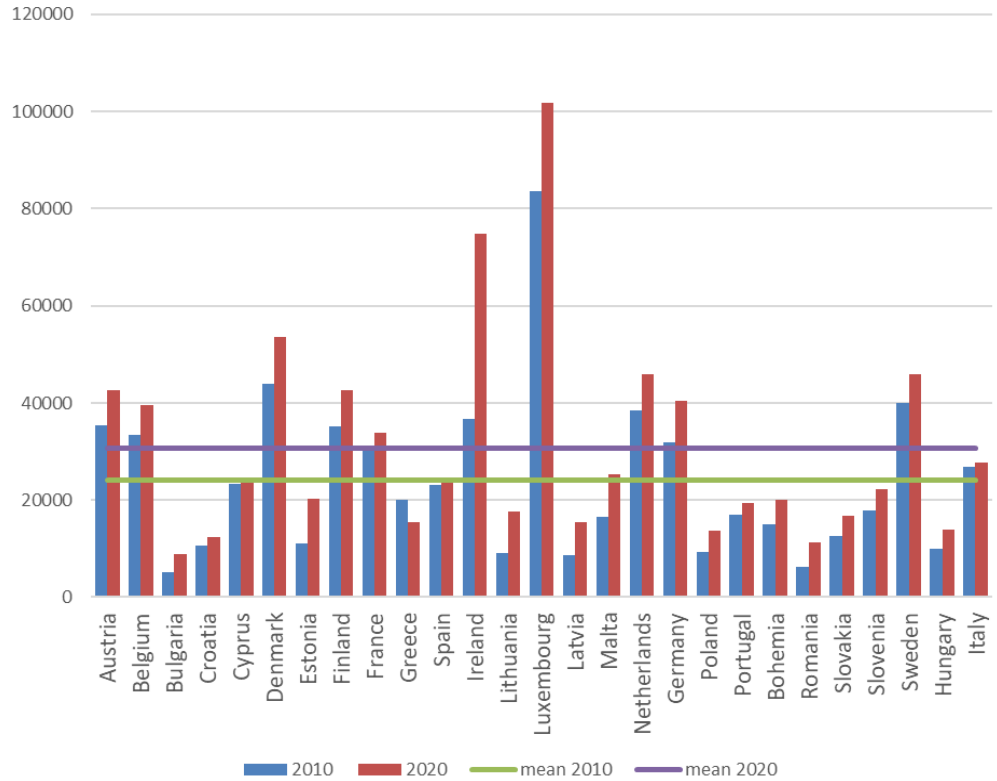
High incomes between 45,000 USD and 60,000 USD per capita are also recorded by Denmark, the Netherlands, Austria, Germany, Sweden, Belgium, Finland and France. Slightly lower between 40,000 USD and 45,000 USD per capita incomes are found in Malta, the Czech Republic and Italy. The remaining EU countries have incomes below 40,000 USD. In Central and Eastern European countries, GDP per capita ranges from 23,741 USD in Bulgaria to 40,293 USD in the Czech Republic.

Against this background, Poland's position is weak. With the value of GDP per capita according to the PPP equal to 33,739 USD in 2020. Poland was ranked 19th, which meant that it qualified for the bottom half of the ranking of the enlarged EU countries, ahead of Portugal, Hungary, Slovakia, Latvia, Romania, Greece, Croatia and Bulgaria. Due to the recession during the Covid - 19 pandemic, Poland's ranking

in terms of *per capita* income according to the PPP improved by several places compared to previous years.

The size of GDP per capita has also increased markedly in the EU over the past few years. While the average level of GDP per capita in the 27 EU member states was 24,000 euros at the beginning of 2010, by the beginning of 2020 this value had risen to around 32,000 euros. In 2020, the highest GDP per capita was characterized by: Luxembourg, Denmark, Sweden and Ireland, while the lowest were Romania, Bulgaria, Lithuania and Latvia (Figure 4).

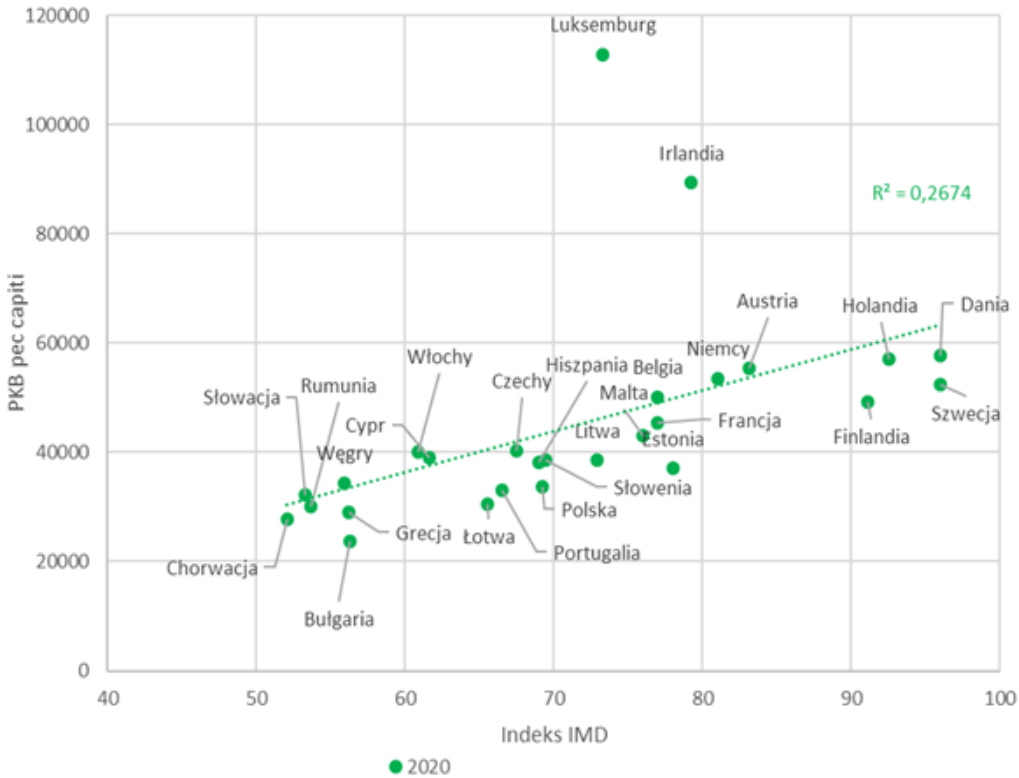
Figure 4. *Gross domestic product in EU member states per capita at market prices in euros in 2010 and 2020*



Source: *Own work based on Ranking out of 67 countries, World Competitiveness Ranking, IMD, https://www.imd.org/centers/wcc/world-competitiveness-center/rankings/world-competitiveness-ranking/rankings/wcr-rankings/#_tab_Rank.*

An analysis of the dynamics of change in the IMD index and GDP per capita for EU member states confirmed that as GDP per capita increased, there was an increase in the IMD index reporting the progress of digitization and innovation in the economy. For all EU member states, the increase in digitization was accompanied by an increase in GDP per capita (Figure 5).

Figure 5. *Relationship between IMD index and GDP per capita for individual EU member states (according to 2020 ranking)*



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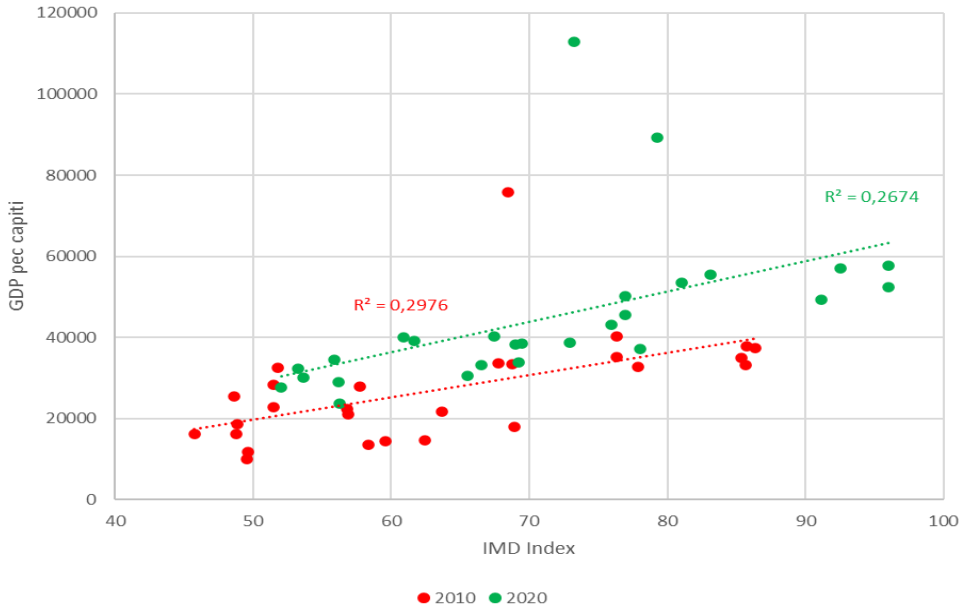
The IMD's report assessing countries' digital competitiveness also identifies indicators for technology and scientific infrastructure, which are also assessed and detailed in the rankings. Subsequent rankings of countries' digital competitiveness after 2010 have included increasingly newer criteria to measure countries' ability to adopt and discover digital technologies leading to the transformation of government practices, business models and society in general (Grzebyk and Walenia, 2014). An analysis of these reports indicates an increase in countries' digital competitiveness, which depends on the growth of GDP per capita (Figure 6).

The IMD report assessing countries' digital competitiveness identifies indicators for technology and scientific infrastructure that are also included in other rankings.

However, the Digital Competitiveness Ranking introduces several new criteria to measure countries' ability to adopt and discover digital technologies that contribute to economic growth (Guellec and Paunoy, 2018).

Figure 6. *Relationship between IMD index and GDP per capita for individual EU member states by 2010 and 2020 ranking*



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The IMD reports directly relate to the goals of the Europe 2020 Strategy, i.e. smart, sustainable and inclusive growth, which established 7 flagship initiatives (Cockburn *et al.*, 2018; Piętak, 2017; Puślecki and Walkowski, 2010):

- The European Digital Agenda - a single digital market with high-speed Internet access,
- Innovation Union - using innovation activities to solve today's problems of climate change and energy efficiency,
- Mobile youth - ease of studying abroad, better preparation for entering the labor market,
- Resource-efficient Europe - greater energy security, lower CO_2 emissions,
- Industrial policy in the era of globalization - helping companies adapt to the global environment,
- Program for new skills and employment - reducing unemployment,
- Lifelong learning, training to help acquire new skills.

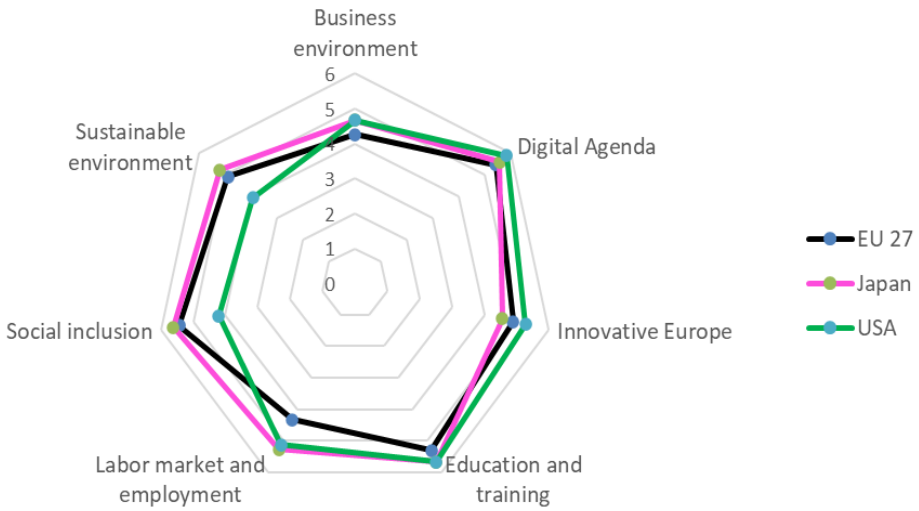
Europe's anti-poverty agenda - respecting the rights of the socially excluded and poor and their integration into the rest of society. On the basis of Eurostat data, the World Economic Forum has, since 2012, produced an annual Europe 2020 Competitiveness Report, which assessed the progress of each EU member state in

implementing the Europe 2020 Strategy's flagship initiatives. As standard, the Scandinavian countries of Sweden, Finland and Denmark ranked highest in this ranking.

In the ranking of world economies, the economies of Japan, Canada and the USA were particularly prominent (imd.org; ec.europa.eu; European Commission 2020/2021). In the competitiveness ranking, a country's position depends on its effectiveness in the area of 7 pillars. A comparative analysis of the implementation of these pillars by EU countries in relation to the leading world economies at the end of 2020 showed that the EU did not have an advantage in any of the analyzed pillars. It should be mentioned that, according to the strategy, it should achieve it by 2020.

In the area of the seven pillars of the Europe 2020 Strategy, the highest position in 2020. The EU achieved in education and training, social inclusion and environmental sustainability. The EU's weakest position was in innovation activities and the digital agenda, areas shown in the IMD reports (Figure 7).

Figure 7. *Performance ranking of the EU27 and leading world economies in the 7 pillars of the Europe 2020 Strategy*



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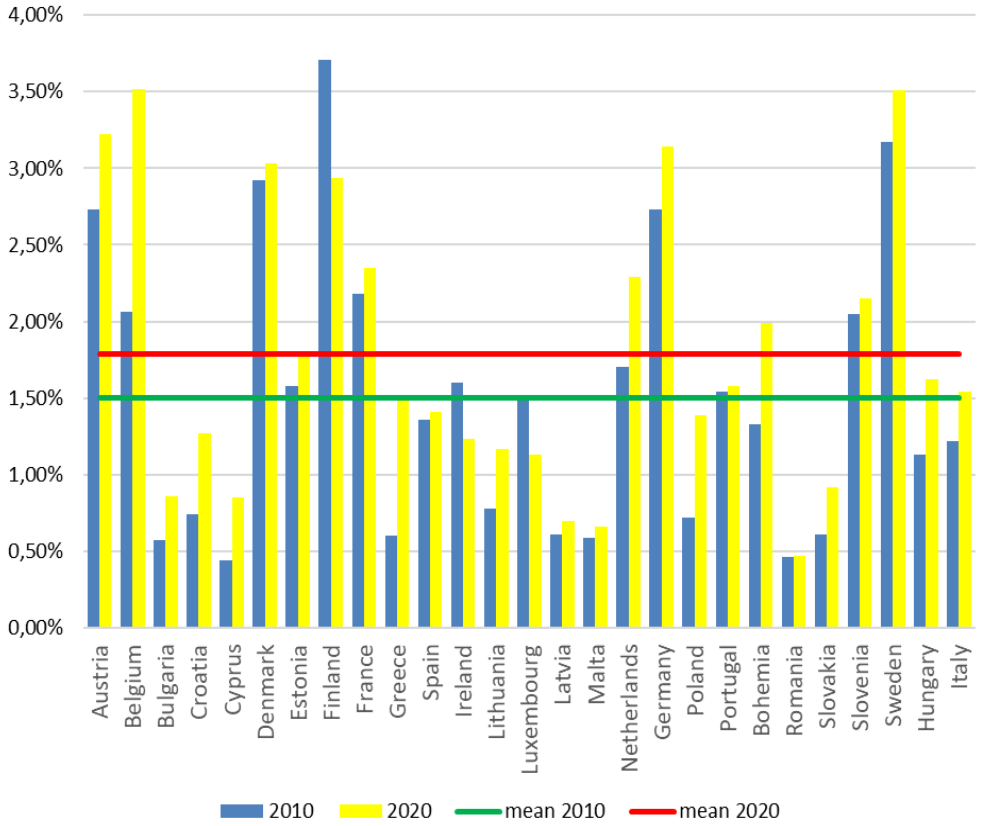
Research and development (R&D) activity is a key driver of innovation in European Union countries, as it directly contributes to the development of new technologies, products and processes. Investment in R&D has a significant impact on a country's ability to develop and implement innovations, which affects an economy's

international competitiveness. R&D activity is one of the most important factors shaping the innovativeness of EU countries.

Countries with high R&D spending lead the innovation rankings, and innovative economies are more resilient to crises and more competitive in the global market. Innovative economies have greater potential in increasing their GDP. EU countries are characterized by very high variation in terms of research + development (R&D) spending (Figure 8).

Figure 8. *Expenditures on research and development (R&D) - as % of GDP*



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In 2010, there were 10 countries where the level of R&D spending did not exceed 1% of GDP. In that year, Finland (3.71%), Sweden (3.17%), Denmark (2.92%), Germany and Austria (2.73%) and France (2.18%) spent relatively much. In 2010, the average R&D spending rate of 1.5% was not reached by 14 member states. In contrast, the number of European countries with an increase in R&D spending increased in 2020. In 2010, the 3% level of R&D spending adopted in the Strategy

was achieved by Finland (3.71% of GDP) and Sweden (3.17% of GDP). In 2020, the 3.00% R&D spending rate was achieved by Sweden (3.51%), Germany (3.14%), Denmark (3.03%), Belgium (3.52%), Austria (3.22%).

In 2020, in terms of R&D spending, the EU countries were highly polarized, which should be largely linked to the different structures of these economies. In addition to the aforementioned innovation leaders, there was a significant group of countries where R&D spending was less than 1% of GDP (Bulgaria, Cyprus, Latvia, Malta, Romania and Slovakia) or oscillated around the level of 1.5% of GDP (Portugal, Luxembourg, Spain, Italy and Hungary).

Comparing 2010 and 2020 data, it should be noted that R&D spending increased in the vast majority of EU countries, although the rate of increase, with the exception of Greece (0.60% of GDP in 2010 and 1.49% of GDP in 2020), was not significant. In 2020, a decrease in spending in this area compared to 2010 was recorded in Luxembourg, Finland and Ireland (European Commission 2020/2021).

It is important to build innovation awareness among EU companies, implement a system of incentives aimed at increasing the share of companies in financing R&D and information technology spending, while reducing existing spending in the area of non-technological innovation, and training, design, marketing, among others. In addition to the relatively low cost of labor in the global economy, competitiveness based on products created using modern technologies should be important (Kusz *et al.*, 2023; Kusz *et al.*, 2022).

The possibility of facing global competition from other regions of the world (USA, Japan, India, China) is conditioned by the necessity of a much greater involvement of public funds both from the EU budget, as well as from individual member states and private research funding. Leading in this regard should be applied research and development in the development of new technologies and renewable energy sources (Kusz *et al.*, 2022).

4. Conclusions

In conclusion, it should be said that the use of this indicator brings many benefits to both decision-makers at the level of a country's economy, individual entrepreneurs (especially large ones) and current and potential investors. Among the key benefits of implementing the effects of the IMD index is the ability to synthetically assess the economic competitiveness of a country and sometimes even a region. The index assesses various aspects of the economy, such as productivity, infrastructure, human resources and the efficiency of public institutions. This allows countries' rulers to assess how they are doing compared to other economies.

The IMD report also supports the development of national economic policy by providing detailed analysis on the strengths and weaknesses of economies.

Governments can use this information to formulate economic strategies that promote improvements in a country's competitiveness. Examples include changes in the education system, tax policy or investment in infrastructure. Changes made in a country can attract foreign investment because a country's position in the IMD ranking is an important signal to foreign investors. It allows to assess how stable and business-friendly the economic environment of a country is. The higher the ranking, the greater the likelihood of attracting foreign investment, which can lead to economic growth and job creation.

The evolution of the IMD index over the years also provides an opportunity to motivate reform and innovation by comparing countries in terms of innovation, management efficiency, infrastructure quality and ability to implement change. With the IMD index, it is possible to see that other countries are performing better in certain areas. This can provide the impetus to make changes to improve. Analyzing changes in the index allows you to monitor the progress made by a country over time. The IMD Index is a useful tool for monitoring the effectiveness of actions taken and adjusting economic strategies. Also, companies can use the data to forecast changes and prepare long-term development plans.

Achieving a high ranking in the IMD index also helps promote a country's image, as it positively affects the perception of the country on the international stage. It is a way to promote and build a positive image as a place conducive to innovation, investment and economic development.

IMD's report assessing countries' digital competitiveness beyond digital technologies identifies indicators for technology and scientific infrastructure that are evaluated and detailed in the overall rankings. Subsequent rankings of countries' digital competitiveness after 2010 include increasingly newer criteria to measure countries' ability to adopt and discover digital technologies leading to the transformation of government practices, business models and society in general.

Analysis of IMD reports made using statistical methods made it possible to verify the research assumptions made. The research confirmed the occurrence of an increase in the digital competitiveness of EU countries between 2010 and 2020. The competitive position of EU member states determined by the IMD report is correlated with the ranking of countries determined by the GDP per capita index. The analysis of the dynamics of changes in the IMD index and GDP per capita for EU member states confirmed that with the increase in GDP per capita there was an increase in the IMD index reporting the progress of digitization and innovation in the economy. For all EU member states, the digitization index was associated with an increase in GDP per capita.

However, the competitiveness of the economically weakest EU member states (i.e., Bulgaria, Cyprus, Latvia, Romania) as determined by the IMD report in 2010 and compared to the 2020 ranking did not improve significantly. This demonstrates the

weak development capabilities of these countries. The highest places in the IMD competitiveness rankings are occupied by non-EU countries, as well as the most economically developed EU countries like Sweden, Finland, Denmark and Germany.

The listed most competitive countries in the IMD ranking also occupy the highest places in other competitiveness rankings published by international institutions like the Human Development Index (HDI), the Regional Competitiveness Index (RCI)**,** the Heritage Foundation's Index of Economic Freedom (IEF). Within the group of EU member countries, the weakest competitive position in the digital field is occupied by: Romania, Bulgaria and Slovakia.

The last places in the IMD ranking are occupied by, Indonesia, Ukraine, Mongolia, Peru and Venezuela, countries that not only have weak economic development, but also fail to invest in the development of the human resources at their disposal. The basis for the competitiveness of EU member states can become an advantage based on modern technology.

Europe should take innovative actions to use the results of research and transform them into marketable products and processes that stimulate economic growth, for the innovative capacity of a country is a factor and condition of competitiveness. The level of innovation is determined not only by the state of advancement of new technologies, but also by the stock of knowledge and skills of employees, i.e. human capital.

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