

## SPATIAL VARIATIONS IN THE LEVEL OF ENTREPRENEURSHIP IN EUROPEAN UNION COUNTRIES

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**Purpose:** Entrepreneurship, coupled with competitiveness and innovation, is currently a major driver of socio-economic development, contributing to the creation of new jobs and enhancing the prosperity of local communities. The aim of this study is to analyze and evaluate the level of entrepreneurship in the European Union (EU) countries in 2020, highlighting the similarities in entrepreneurship levels across the examined countries.

**Design/methodology/approach:** The ease of doing business index was used to assess the level of entrepreneurship and to rank EU countries in terms of their entrepreneurial environment. To supplement this research, Ward's method was employed to identify clusters of geographical units with similar levels of entrepreneurial potential.

**Findings:** Levels of entrepreneurship vary significantly among EU countries. The study identified countries with very low, low, high, and the highest levels of entrepreneurial potential. The substantial gap between top-ranking countries and those at the end of the list points to significant territorial disparities in the level of entrepreneurship within EU countries.

**Social implications:** Investigating the level of entrepreneurship is a vital aspect of assessing the socio-economic development of geographical units and the living standards of local communities. Therefore, understanding the nature of spatial differentiation in entrepreneurship levels across countries is essential. This understanding plays a significant role in shaping the socio-economic development of geographical units and influences the realization of development priorities for individual countries and the EU as a whole. Entrepreneurship is one of the pillars of the European Employment Strategy, aimed at reducing unemployment levels, and consequently, poverty and social exclusion.

**Originality/value:** The findings of this research can aid in entrepreneurship management by state governments, especially in terms of facilitating business start-ups and modifying the financial and tax systems to better cater to entrepreneurs' needs. Moreover, the results of this analysis can serve as a knowledge source for both national and regional economic policy actors, as well as EU policymakers. It provides valuable insights into public support strategies aimed at enhancing entrepreneurship levels in future development programming perspectives.

**Keywords:** Entrepreneurship, Socio-economic development, European Union, Ease of Doing Business Index, Ward's Method.

**Category of the paper:** Research paper.

## 1. Introduction

Entrepreneurship, coupled with competitiveness and innovation, is currently a major driver of socio-economic development, contributing to the creation of new jobs and enhancing the prosperity of local communities. Entrepreneurship, in its broadest sense, poses a significant challenge, especially in today's modern knowledge and information-based economy. This fresh knowledge is pivotal in molding the information revolution, which, as per K. Wach, "(...) is swiftly and dynamically undergoing redefinition and reconfiguration towards the entrepreneurial revolution. The entrepreneurial society has indeed become the bedrock of the economy and economic growth" (Wach, 2014, pp. 14-15).

Given the interdependencies that exist at the entrepreneurial, regional, and national levels, the entrepreneurial environment is a crucial factor in activating territorial units. The aim of this study is to analyze and evaluate the level of entrepreneurship in the European Union (EU) countries in 2020, highlighting the similarities in entrepreneurship levels across the examined countries. The analysis covers the year 2020, – utilizing complete, current data from the Doing Business Database.

To fulfill the research objective, the synthetic index of ease of doing business was assessed, and Ward's clustering method (1963, pp. 236-244) was utilized. Based on this indicator, the ranking of EU countries in terms of entrepreneurship levels was determined, while cluster analysis helped identify groups of geographical units with similar levels of entrepreneurship. The focus of this article is the territorial aspect of variations in entrepreneurial potential across the 27 EU countries in 2020. To comprehensively present the issue, we employed the ease of doing business indicator, sub-indicators (10 categories), and a set of diagnostic variables. Data from the Doing Business Data Bank (Doing Business 2020) was used to evaluate the level of entrepreneurship. While working towards the research objective, special attention was given to spatial variations in the level of entrepreneurship among the studied countries. The analysis enabled us to identify countries with very low, low, high, and the highest levels of entrepreneurship.

## 2. Entrepreneurship – conceptual scope

Entrepreneurship is a complex and multifaceted subject, which explains why a unified theory of entrepreneurship has yet to emerge. Despite the plethora of terms for the concept, finding a precise definition of this economic category in literature is challenging. This topic attracts scholars from various economic and social fields. Consequently, representatives of many scientific disciplines – including economics, demography, law, psychology, sociology,

political science, cultural studies, and management – have addressed the issue of entrepreneurship (Kapusta, 2006, p. 17; Ferreira et al., 2017). The different methods, research techniques, goals, and planes of analysis have not contributed to a clear and universal definition. However, most attempts to interpret this concept emphasize its economic aspect (Duraj, Papiernik-Wojdera, 2010, pp. 19-21). In economics, entrepreneurship is definitively linked with the activities of economic agents aiming at generating maximum profits through efficient resource allocation.

The pioneers of the scientific approach to entrepreneurship were: R. Cantillon and J.B. Say. It's widely accepted that the term "entrepreneurship" first started to be used by J.B. Say, who also categorized types of entrepreneurs. Say believed that entrepreneurship's essence is found in the entrepreneur's behavior, who relocates economic resources from less productive to more productive areas, thus increasing production and enabling higher profits (Piecuch, 2010, p. 15). For both Cantillon and Say, the entrepreneur's primary function was risk-bearing.

Contemporary scientific research on understanding the nature of entrepreneurship refers mainly to the theories of J. Schumpeter, F. Knight, and the Austrian School (Gaweł, 2007, p. 14). According to these schools of thought, entrepreneurship is:

- "The introduction of new combinations of company organization – new products, services, sources of raw materials, production methods, markets, and forms of organization" (J. Schumpeter);
- "Earning profits in exchange for bearing uncertainty and risk" (F. Knight);
- "Bearing uncertainty, coordinating production resources, innovating, and providing capital" (B. Hoselitz);
- "A purposeful activity aimed at establishing and developing a profit-oriented business" (A. Cole) (Gołębiowski, 2014, p. 11).

The abundance of definitions and diverse interpretations, along with the concept's multifaceted nature, make it challenging to determine a universal definition of entrepreneurship. However, it can be considered from the following perspectives (Makiela, 2008, p. 9):

1. The process: Entrepreneurship as the act of building and creating something new, such as a new business. It's an organized sequence of actions, under given premises, that utilizes an innovative idea to generate financial gains in the market. This perspective emphasizes the ability to seize opportunities, innovate, and manage risks and uncertainties.
2. Traits: A set of characteristics that describe an entrepreneur's actions. Traits such as activity, dynamism, a willingness to take risks, adaptability to change, and an ability to recognize and seize opportunities are typically associated with entrepreneurship.
3. Innovation: This relates to the introduction of newness, reform, and improvement across all spheres and areas. Any enhancement of equipment and machinery, system reform, or creation of new things, values, or phenomena can be considered innovative.

H. Landström further identifies three functions of entrepreneurship as a scientific discipline (Landström, 2010, pp. 11-13; cited in: Wach, 2014, pp. 14-15):

- Entrepreneurship as a market function;
- Entrepreneurship as a function of the individual entrepreneur;
- Entrepreneurship as a process, distinguishing between the process of creating new products and the process of discovering opportunities.

Furthermore, entrepreneurship can be understood in both narrow and broad terms (Guerrero et al., 2020; Gumbau-Albert, 2017). The narrow understanding of entrepreneurship captures it as the act of starting a new or managing one's own business (Doing Business, 2020; Ferreira et al., 2017; Markowska et al., 2019). This approach enables measuring entrepreneurship, for instance, through the proportion of newly established companies in the total number of firms active in the market. On the other hand, a broad definition of entrepreneurship entails the search for and exploitation of market opportunities, the implementation of innovations, and risk-taking (Markowska et al., 2019; Sanjay, Karri, 2006; García-Peñalosa, Wen, 2008). Entrepreneurship can occur at different levels: companies - micro level (Larsson, Thulin, 2019; Wach, 2015, pp. 28; Audretsch, Link, 2019; Audretsch, Link, Lehmann, 2020; Link, Morris, van Hasselt, 2021), regions - meso level (Fritsch, Wyrwich, 2014; Huggins et al., 2017), and countries - macro level (Saunoris, Sajny, 2017; Ferreira et al., 2017; Nițu-Antonie, Feder, Munteanu, 2017; Rodrigues, Brás, Soukiazis, 2019). Some literature also highlights entrepreneurship within industries, sectors, or social groups, such as women (Hopp, Martin, 2017).

Presently, entrepreneurship is widely seen as a factor of production alongside labor, land, and capital. It plays a role in the creation and implementation of products, boosting the regional economy (Jędrzejewski, 2015, p. 56). The primary elements of the entrepreneurial environment, as identified by theorists, include an innovative environment, institutional infrastructure, and a favorable social climate. A well-ordered combination of these elements is crucial for stimulating regional development (Huggins, Thompson, 2015, pp. 105-106; Jędrzejewski, 2015, p. 49; Glinka, Gudkova, 2011, pp. 53-55).

Assessing the influence of entrepreneurship on regional development is a much-discussed topic. Theorists D. Valerie and R. Peterson (2009, p. 462) contend that entrepreneurship impacts regional development through efficient resource utilization, innovative activities, and heightened competition. These effects are long-term, becoming apparent over time. For entrepreneurship to effectively contribute to a region's development, the region needs to have supportive economic, psychological, legal, and institutional conditions, along with a strategic utilization of its academic potential (Kola-Bezka, 2010, p. 404; Aparicio, Urbano, Audretsch, 2015).

### 3. Research methodology

The "Ease of Doing Business" index was employed to examine the variation in entrepreneurship levels across EU countries<sup>1</sup>. This index was devised by World Bank<sup>2</sup> economists and has been published since 2005 under the name "Doing Business: Comparing Business Regulation in 190 Economies". A country's ranking is based on the average of the following ten sub-indicators (Doing Business, 2020, Comparing..., p. 5):

1. Starting a Business: Procedures, time, cost, and paid-in minimum capital required to establish a limited liability company for both men and women.
2. Dealing with construction permits: Procedures, time, and cost to complete all the formalities required to construct a warehouse, along with the quality control and safety mechanisms in the construction permitting system.
3. Getting electricity: Procedures, time, and cost to get connected to the electrical grid, the reliability of the electricity supply, and the transparency of tariffs.
4. Registering property: Procedures, time, and cost to transfer property, and the quality of the land administration system for both men and women.
5. Getting credit: Movable collateral laws and credit information systems.
6. Protecting minority investors: Rights of minority shareholders in related-party transactions and in corporate governance.
7. Paying taxes: Payments, time, and total tax and contribution rate required for a company to comply with all tax regulations as well as post-filing processes.
8. Trading across borders: Time and cost to export the product of comparative advantage and to import auto parts.
9. Enforcing contracts: Time and cost to resolve a commercial dispute, and the quality of judicial processes for both men and women.
10. Resolving insolvency: Time, cost, outcome, and recovery rate for a commercial insolvency and the strength of the legal framework for insolvency.

The report provides data on individual indicators, as well as two aggregate measurements, which include:

- ease of doing business ranking;
- Distance to Frontier (DTF) Index: a measurement that indicates how far an economy (on average) deviates from the best performance achieved by any of the 190 surveyed economies under each of the developed indicators.

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<sup>1</sup> It's worth noting that in the World Bank's research, entrepreneurship is seen as the process of starting and running a business (Doing Business, 2020).

<sup>2</sup> Other organizations studying entrepreneurship in the European market include the OECD, the European Commission, and the Global Entrepreneurship Monitor.

The score is normalized from 0 to 100, where 0 is the lowest value and 100 represents the best practice limit. A higher ranking signifies better, typically simpler, regulations for conducting business and stronger protections for property rights.

Regrettably, the index was discontinued in 2021 due to controversy over its calculation and ranking. Thus, 2020 was the last year in which entrepreneurship research was conducted utilizing this index<sup>3</sup>. However, in May 2023, The World Bank published a methodology to replace the existing index<sup>4</sup>.

The calculated indicator was utilized to rank EU countries in terms of the identified level of entrepreneurship. The value of the ease of doing business index facilitated the categorization of countries into four groups according to their levels of entrepreneurship (Zeliaś, 2000):

- I Countries with the highest levels of entrepreneurship,  $w_i \geq \bar{w}_l + S_{wi}$ ;
- II Countries with high levels of entrepreneurship,  $\bar{w}_l \leq w_i < \bar{w}_l + S_{wi}$ ;
- III Countries with low levels of entrepreneurship,  $\bar{w}_l - S_{wi} \leq w_i < \bar{w}_l$ ;
- IV Countries with very low levels of entrepreneurship,  $w_i < \bar{w}_l - S_{wi}$ .

where:

$w_i$  – value of the synthetic indicator;

$\bar{w}_l$  – arithmetic mean of the synthetic indicator;

$S_{wi}$  – standard deviation of the synthetic indicator.

The analysis was supplemented by spatial classification of units based on their potential to foster entrepreneurship using cluster analysis. The premise of this analysis is the segmentation of data to identify homogeneous objects within the population studied. The division of a group into individual groups is carried out in such a way as to obtain clusters in which the elements in the same group are similar to each other and at the same time different from the elements in the other groups (Gatnar, Walesiak, 2004).

Ward's method, which belongs to the hierarchical methods of object classification, was used to group EU countries into clusters. This method minimizes the sum of squares of distances from the centroid of the newly formed cluster. Consequently, a group will comprise objects that are least differentiated by the describing variables. Thus, Ward's method ensures homogeneity within clusters and heterogeneity between clusters, and therefore is considered to be most effective (Panek, Zwierzchowski, 2013; Ward, 1963; Strahl, 2006; Młodak, 2006; Szkutnik et al., 2015). The analysis produces a dendrogram, which graphically interprets the results. The next stage of the research involves determining the optimal number of classes.

<sup>3</sup> The United Kingdom was excluded from the research because it ceased to be a member of the EU as of February 1, 2020, despite a "transition period" in mutual relations stipulated by the EU Withdrawal Agreement.

<sup>4</sup> The World Bank Group launched a new flagship initiative called the Corporate Business Ready (B-READY) program, which annually assesses the business and investment environment worldwide. B-READY enhances and replaces the Doing Business program (Business Ready).

The research was conducted using standardized variables<sup>5</sup> derived from World Bank data, with Euclidean distance used for clustering. The analysis using Ward's method enabled the clustering of countries that are most similar to each other and maximally different from others in terms of the selected characteristics determining the level of entrepreneurial potential. The resulting synthetic entrepreneurship index  $W_i$  takes values between 0 and 100. A value closer to 100 indicates that the object (country) has a higher level of entrepreneurship. In the conducted study, a critical value was determined on the basis of the analysis of the graph of the course of agglomerations. After observing the largest increment, in which numerous clusters are formed approximately at the same connectivity distance, there is a cut-off dividing the set into classes.

#### 4. Level of entrepreneurship in European Union countries in 2020 based on the ease of doing business index

The World Bank's Doing Business 2020 report provides a relevant ranking for assessing the ease of doing business, which is instrumental for our subject of study – the level of entrepreneurship. It is worth noting that the World Bank's analysis encapsulates entrepreneurship as the process of initiating and operating a business. Leveraging the synthetic index of the ease of doing business, we constructed a ranking of EU member states according to their entrepreneurial potential (refer to Table 1 and Figure 1). The values of the sub-indicators are shown in Figure 2. The countries under study were categorized into groups with the highest, high, low, and very low levels of entrepreneurial potential, utilizing the arithmetic mean and standard deviation of the synthetic indicators. The classification of countries based on the entrepreneurship index revealed significant disparities in their potential. The gap between the highest value of 85.29 (achieved by Denmark) and the lowest value of 66.14 (achieved by Malta) in 2020 was a substantial 19.15 points.

**Table 1.**

*Level of entrepreneurship in European Union countries in 2020 based on the ease of doing business index*

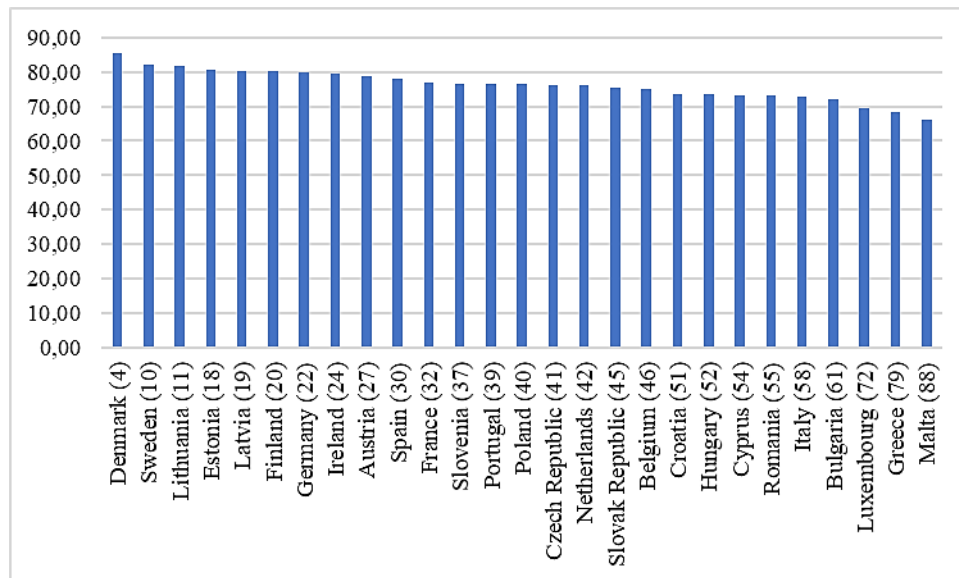
Ranking position	Country	Indicator value $W_i$
<b>Group of countries with the highest level of entrepreneurship</b>		
$W_i \geq 80.59$		
1.	Denmark	85.29
2.	Sweden	81.99
3.	Lithuania	81.62
4.	Estonia	80.62

<sup>5</sup> Statistica 13.1 software was used for the calculations.

Cont. table 1.

<b>Group of countries with the high level of entrepreneurship</b>		
76.22 ≤ Wi < 80.59		
5.	Latvia	80.28
6.	Finland	80.18
7.	Germany	79.71
8.	Ireland	79.58
9.	Austria	78.75
10.	Spain	77.94
11.	France	76.80
12.	Slovenia	76.52
13.	Portugal	76.47
14.	Poland	76.38
15.	Czech Republic	76.34
<b>Group of countries with a low level of entrepreneurship</b>		
71.84 ≤ Wi < 76.22		
16.	Netherlands	76.10
17.	Slovak Republic	75.59
18.	Belgium	74.99
19.	Croatia	73.62
20.	Hungary	73.42
21.	Cyprus	73.35
22.	Romania	73.33
23.	Italy	72.85
24.	Bulgaria	71.97
<b>Group of countries with a very low level of entrepreneurship</b>		
Wi < 71.84		
25.	Luxembourg	69.60
26.	Greece	68.42
27.	Malta	66.14

Source: own study based on Doing Business 2020 and Doing Business 2020. Region Profiles European Union (EU).



\*In parentheses are the positions of EU countries in the ranking of 190 countries in the world.

**Figure 1.** Spatial variation of the level of entrepreneurship in EU countries in 2020.

Source: own study based on data from Table 1.

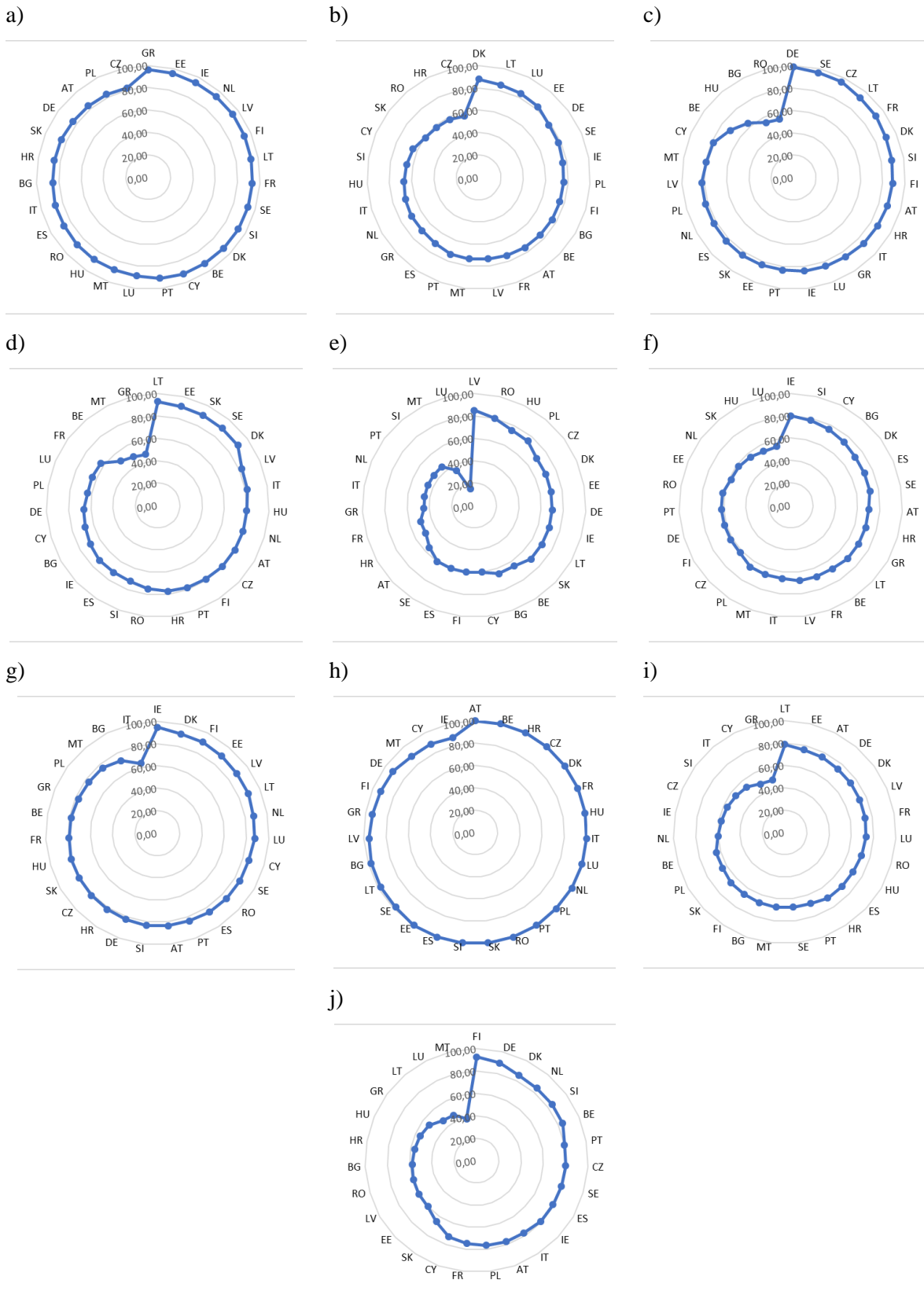


The countries with the highest level of entrepreneurial potential in 2020 were: Denmark, Sweden, Lithuania and Estonia<sup>6</sup>. The entrepreneurship index in these countries ranged from 85.3 to 80.6 and was 1.1 to 1.05 times higher than the EU average. These countries thereby hold a significant business advantage over other member countries. One determining factor of each country's ranking is the procedure for establishing a business, which is primarily seen by entrepreneurs as a key driver of entrepreneurship.

Denmark led the ranking primarily due to its top position in the sub-indicator: Dealing with construction permits, scoring 87.88 points (Fig. 2b). In other categories, Denmark secured high positions, ranging from 3rd to 5th, with an 11th place ranking among EU countries for Starting a Business (Fig. 2a). Danish law contains the fewest procedures, which have been streamlined over the years. Denmark has taken steps to make it easier to start a business by lowering the minimum capital requirement for limited liability companies from \$22,850 to \$14,620 in 2011, enabling real estate registration and introducing electronic filing of land registry transfer applications in 2013, reducing the required minimum capital again in 2015, introducing an online platform to complete business and tax registration simultaneously in 2016, and reducing the cost of obtaining building permits and eliminating building permit fees in 2020. It's noteworthy that the average period in Denmark, as well as in the Netherlands, from submission of documents to receipt of confirmation of registration is the shortest among the EU countries at 3.5 calendar days. The cost of setting up a company, analyzed as a percentage of per capita income, is among the lowest in Denmark at 0.20% of income (in Slovenia it is zero). However, the combined tax and contribution rate calculated as a percentage of profit was 23.80% (5th in the EU). Notably, Denmark ranked 4th out of 190 countries worldwide, trailing only New Zealand, Singapore, and Hong Kong SAR, China (Fig. 1).

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<sup>6</sup> Chapter 4 of the article is based on Doing Business 2020. Comparing Business Regulation in 190 Economies and Doing Business 2020. Region Profiles European Union (EU).



**Figure 2.** Values of the sub-indicators in European Union countries in 2020  
 a) Starting a business; b) Dealing with construction permits; c) Getting electricity; d) Registering property  
 e) Getting credit; f) Protecting minority investors g) Paying taxes; h) Trading across borders;  
 i) Enforcing contracts; j) Resolving insolvency.

Source: own elaboration based on Doing Business database.

Sweden's potential for entrepreneurship was mainly determined by high scores in the sub-indicators for the following categories: Getting Electricity (2nd position; 96.21 points), Registering Property (4th position; 90.11 points), Dealing with Construction Permits (6th position; 78.05 points), Protecting Minority Investors (7th position; 72 points) and 9th position for the category: Starting a Business and Resolving Insolvency with sub-indicator values of 93.11 points and 79.51 points, respectively (Fig. 2a-d, 2f, 2j). Over the years, Sweden's procedures for establishing and operating businesses have evolved to reduce restrictions. Among the changes made were: in 2011, it became easier to register real estate, the requirement to obtain a waiver of pre-emption from the municipality was eliminated, investor protection was strengthened by requiring greater corporate disclosure, and transactions between interested parties were regulated. Additionally, the minimum capital requirement for limited liability companies was halved. Sweden reduced the corporate income tax rate in 2014, facilitated real estate registration by fully implementing a new real estate registration system in 2015, required company registration with the Companies Registry within five days in 2016, and facilitated property transfers by increasing administrative efficiency and introducing a so-called independent and separate map error reporting mechanism in 2017. The average time to set up and confirm a business in Sweden is 7.5 calendar days, which is in line with the rest of the Nordic countries. The cost of starting a business in Sweden, calculated as a percentage of per capita income, is 0.5%. The combined tax and contribution rate analyzed as a percentage of profit was 49.10%, which put Sweden in 20th place in the EU. Notably, entrepreneurship in Sweden was characterized by sub-indicators that exceeded the average values for the EU for the 9th category, with the exception of the Getting Credit category, which was at the same level for both the EU countries and Sweden, at 60.0 points (Fig. 2e). In terms of entrepreneurial potential, Sweden ranked 10th among the world economies surveyed (Fig. 1).

Lithuania ranked 4th in the group of countries with an entrepreneurship index of  $Wi \geq 80.59$  (index score of 81.62 points). The country's high ranking was primarily due to high scores in the following categories: Registering Property (1st place; 92.97 points), Enforcing Contracts (1st place; 78.80 points), Dealing with Construction Permits (2nd place; 84.87 points), Getting Electricity (4th place; 92.94 points), and Paying Taxes (6th place; 88.81 points) – Fig. 2b-d, 2g, 2i). Lithuania ranks weakest for the Resolving Insolvency sub-indicator (25th; 46.69 points) – Fig. 2j. In the Registering Property category, the registration time is 3.5 calendar days, and the cost calculated as a percentage of the value of the property was 0.8%, which is less than six times lower than the EU average. This is one of the lowest values among all EU countries, earning Lithuania 3rd place after Poland and the Slovak Republic. Lithuania has a limited number of procedures (4) and a short establishment time of 5.5 calendar days, which is more than 2.2 times faster than the average time in the EU. The cost of starting a business accounted for 0.50% of per capita income, which was more than six times lower than the EU average. However, the minimum value of paid-in capital, analyzed as a percentage of per capita income, was 16.0%, two times higher than the EU average. In Lithuania,

the combined tax and contribution rate (as a percentage of profit) was 42.60%, 2.4 percentage points higher than the EU average. All these indicators are the result of measures Lithuania has taken to improve the level of entrepreneurship; among them are:

- making it easier to start a business by introducing online registration of limited liability companies and eliminating the notarization requirement for incorporation documents (2013);
- strengthening the secured transactions system by expanding the scope of movable property that can serve as collateral (2014);
- making it easier to start a business by eliminating the need for a company stamp and speeding up value-added tax (VAT) registration (2015);
- making it easier to start a business with the introduction of online VAT registration (2016);
- getting electricity: speeding up the acquisition of electricity due to the introduction of a time limit for the power company to carry out the necessary connection procedures and a reduction in the connection tariff (2017);
- getting electricity: making it easier to procure electricity by streamlining procedures and imposing deadlines for issuing internal electrical installation inspection certificates (2018) and launching an integrated digital application and reducing the cost of new connections (2020);
- protecting minority investors: strengthening protection for minority investors by increasing corporate transparency (2018) and introducing greater disclosure requirements for individual compensation of directors and other senior officers (2019);
- paying taxes: facilitating tax payments by introducing an electronic filing and payment system for VAT, CIT, and social security contributions (2018);
- trading across borders: facilitating exports by improving the automated customs data management system (2019);
- revising regulations on working time, paid annual leave, as well as notice period and severance pay in case of dismissal (2019).

It should be noted that Lithuania ranked high, 11th in the entrepreneurship ranking among the 190 world economies analyzed (Fig. 1). This result is not surprising when considering the aforementioned measures aimed at improving entrepreneurship conditions.

Estonia also recorded a high ease of doing business index at 80.62 points. The country's entrepreneurship stood out for its high levels in the sub-indicators Trading across Borders (99.92), Starting a Business (95.36), Registering Property (91.02), and Paying Taxes (89.88) – Fig. 2a, 2d, 2g, 2h). All these categories exceeded the EU average. Estonia's impressive results were primarily due to the limited number of procedures (3), a short business set-up time of 3.5 calendar days (the EU average was over 12 calendar days), and the cost of establishing a business, which accounted for 1.0% of per capita income and was lower than the EU average

(3.20%). In contrast, the minimum value of paid-in capital was 13.10%, which was 0.6 times the EU average. Note that this value is zero in the following countries: Belgium, Bulgaria, Cyprus, Czech Republic, France, Greece, Ireland, Italy, Latvia, Netherlands, and Portugal. The tax system in Estonia is also significant in the context of entrepreneurship; the combined tax and contribution rate (as a % of profit) was 47.80%, exceeding the EU figure by 1.2 times. Estonia has implemented several changes to enhance the level of entrepreneurship. These include: improving access to credit by enabling out-of-court enforcement of collateral (2011), increasing the premium rate for unemployment insurance (2011), amending Estonia's bankruptcy law to increase the survival chances of viable companies facing insolvency by streamlining procedures and changing qualification requirements for bankruptcy administrators (2011), removing the restriction on night work and shortening the notice period and severance pay applicable to layoffs (2011), easing contract enforcement by reducing court fees (2014), and simplifying business startups by allowing minimum capital to be paid at the time of company registration (2016). Estonia ranked 18th in the entrepreneurship ranking of world economies (Fig. 1).

The largest group, in 2020, consisted of the following 11 countries with high levels of entrepreneurship: Latvia, Finland, Germany, Ireland, Austria, Spain, France, Slovenia, Portugal, Poland, and the Czech Republic. Latvia ranked highest in the categories of: Starting a Business (5; 94.14pts), Paying Taxes (5), Registering Property (6), and Enforcing Contracts (6) – Fig. 2a, 2d, 2g, 2i). The indicators for doing business in Latvia include: the number of procedures (4), the time it takes to set up a business - 5.5 calendar days (2.2 times longer than the average time in the EU), and the cost of setting up one's own business, which accounted for 1.5% of per capita income and was 1.7 percentage points lower than the EU average. In 2019, Latvia increased the cost of paying taxes by increasing the effective corporate tax burden and in 2018 made it easier to enforce contracts by introducing an electronic case management system for judges. Latvia ranked 19th in the Doing Business ranking (Fig. 1).

Finland ranked first for the Resolving Insolvency sub-indicator, with a value of 92.69 pts (Fig. 2j). Setting up a business in the country takes 13 days, and the cost of starting a business is 0.70%, 4.5 times lower than the EU average. The total tax and contribution rate (% of profit) is 36.60%. Among the measures introduced in Finland in 2019-2020 are: lowering the cost of paying taxes, introducing a new, more efficient online portal for filing corporate income tax returns called "MyTax" (2018), and making it easier to start a business by reducing fees and processing time for online company registrations (2020). Finland reached 20th place in a ranking of 190 countries (Fig. 1).

Germany's third position in the high-entrepreneurship group, with a synthetic index value of 79.71, was primarily related to the high value of the Getting Electricity sub-indicators: 98.80 pts (1st place), Resolving Insolvency: 89.81 pts (2nd place), and Enforcing Contracts: 74.10 pts (4th place) – Fig. 2c, 2i-j. The number of procedures in Germany is nine, the time to set up a business is eight days, and the cost of setting up a business accounts for 6.5% of per

capita income, which is more than two times the EU average. Among the measures to strengthen entrepreneurship, the following should be highlighted: the adoption of a new bankruptcy law, which facilitated judicial restructuring of distressed companies and increased creditor participation (2013), and the facilitation of contract enforcement through the introduction of an electronic system for filing initial claims and electronic handling of the process without the need for paper documents (2020). Germany achieved 22nd place in the Doing Business 2020 ranking (Fig. 1).

Ireland was a leader in the fields of: Protecting Minority Investors (1st place), Paying Taxes (1st place), Starting a Business (3rd place), and Dealing with Construction Permits (7th place), with sub-indicator values respectively: 80.00; 94.59; 94.40; and 76.58 points (Fig. 2a-b 2f-g). However, the aggregate assessment of entrepreneurial potential was downgraded due to the low value of the indicator for the Trading across Borders category - the last position; the value of the sub-indicator was 87.25 points, and almost three-fifths of the countries reached the subject value of 100 points. While the time to set up a business in Ireland is long - 11 days - it is somewhat compensated by the low cost of 0.1% of per capita income, which is 32 times lower than the EU average. It should be noted that the Paid-in Minimum Capital (% of income per capita) in the studied country is zero. Strengthening entrepreneurial capacity has taken place in the country under study through: introducing an online business registration system (2013), protecting minority investors by introducing legislation stipulating that directors can be held accountable for breaches of their fiduciary duties (2016), facilitating contract enforcement by making a performance measurement report available to the public to show the court's performance (2018), introducing a consolidated law on voluntary mediation (2018), and improving access to credit information through a new credit registry (2019). In a ranking of 190 world economies, Ireland ranked 23rd (Fig. 1).

The entrepreneurial potential in Austria was competitive with other EU countries in the areas of Enforcing contracts (3rd place; 75.49pts) – Fig. 2i and Trading across borders (Fig. 2h). However, it should be noted that a value of 100pts for this sub-indicator was achieved by fifteen other countries besides Austria. In Austria, starting a business involves 8 procedures, the time to set up a business is rather long at 21 days (more than 1.6 times the EU average), and the cost of starting a business is 4.70% of per capita income (7th compared to other EU countries). The cost of registering property was 4.6% of the property's value, and the total tax and contribution rate (% of profit) is 51.40%, more than 1.3 times the Union average. Among the measures that have served to improve the level of entrepreneurship are facilitating property transfer by requiring all registration applications to be submitted online (2011), enacting a law that simplifies restructuring proceedings and gives priority to the interests of debtors (2012), and amending working time regulations (2020). In the aforementioned classification, Austria was ranked 27th among the world's economies – Fig. 1.

Spain recorded the highest sub-indicator for the Protecting minority investors category with a value of 72 points (Fig. 2f). For other categories, the indicators for Spain were at levels that ranked the country above the 10th position. In Spain, the time to set up a business was comparable to the EU average at 12.5 calendar days, while the cost was 3.9% of per capita income. However, the cost of registering property, analyzed as a percentage of the property's value, was 6.1%. Other taxes paid, calculated as a percentage of profit, amounted to 0.7%. Spain's efforts to ease the process of doing business included eliminating the requirement to obtain a municipal permit before starting a business, improving the efficiency of the commercial registry and simplifying business registration (2014), introducing an electronic system that connects several public agencies, reducing the statutory corporate tax rate (2015), strengthening protection for minority investors by requiring shareholder approval for major sales of company assets (2016), and clarifying ownership and control structures (2020), easing the process of obtaining electricity by upgrading Madrid's electricity grid (2017), and simplifying contract enforcement by reducing court fees for filing lawsuits (2018). Spain ranked 32nd in the global ease of doing business ranking (Fig. 1).

France ranked 34th in the Doing Business 2020 index, with a value of 76.80pts. France achieved the highest sub-indices for Getting electricity (5th place; 92.01 pts), Enforcing contracts (7th place; 73.47 pts), and Starting a business (8th place; 93.15 pts) – Fig. 2a, 2c, 2i). These metrics were reflected in the details, with 5 procedures, a timeline of 4 calendar days, and a start-up cost of 0.70%. It should be noted that the paid-in minimum capital is zero. In contrast, the cost of registering real estate was 7.30% of the property's value, and the cost of obtaining electricity was 5% of per capita income, which was the lowest among EU countries (approximately 23 times lower than the EU average). France has introduced numerous measures to facilitate entrepreneurial activities, including shortening the time for registering a company at a one-stop shop (2015), introducing a corporate tax credit and reducing the rate of labor tax paid by employers (2016), reducing the cost of obtaining construction permits (2017), reducing the rate of social security contributions and training (2018), making it easier to obtain electricity (2019), and changing the Labor Code regarding severance pay for employees after one, five, and ten years of employment.

Slovenia ranked 12th among EU countries in the level of entrepreneurship, with an index value of 76.52 pts. (37th in the world ranking – Fig. 1). Notably, Slovenia achieved a sub-indicator value of 78 pts in the Protecting minority investors category, ranking 2nd (Fig. 2f). Particularly commendable in this category is the indicator of the strength of minority investor protection, where Slovenia scored 39 pts out of a maximum value of 50 pts. The Resolving insolvency sub-index reached 84.40 pts, placing the country 5th globally (Fig. 2j). The process of setting up a business in Slovenia is relatively easy, involving just three procedures and incurring no start-up costs. Measures introduced to bolster entrepreneurship include utilizing more online services for business set-up (2011), streamlining the process of construction permits by removing the need for approval from the water and sewerage supplier

(2014), improving access to credit information (2018), and simplifying contract enforcement (2019). However, in 2019, Slovenia complicated the process of starting a business by mandating companies to declare beneficial ownership independently from the business set-up process.

Portugal scored 76.47 pts on the ease of doing business index, placing 39th in the Doing Business 2020 Ranking (Fig. 1). The country excelled in the Resolving insolvency category (80.17 pts – Fig. 2j; 7th place), boasting a resolution rate of 100%. Establishing a business in Portugal takes approximately 6.5 days, involves six procedures, and costs 1.90% of per capita income. The paid-in minimum capital in Portugal is zero. The total tax and contribution rate (% of profit) stands at 39.80%, in line with the EU average. Portugal has introduced various measures to enhance entrepreneurship, such as simplifying construction permits by streamlining the inspection system (2012) and enforcing strict time limits on urban project processing and simplification of the related procedures (2013), abolishing the obligation to report to the Ministry of Labor when starting a business (2014), accelerating the approval process for electrical connections (2017), reducing the corporate tax rate (2017), and limiting the maximum duration of fixed-term contracts (2017).

In the 2020 global ease of doing business ranking, Poland placed 40th among 190 economies (Fig. 1). Within the EU, Poland ranked 14th, with an index value of 76.38 pts. This was influenced by the sub-indicators for Getting credit (4th place; 75 pts) and Trading across borders (100pts alongside 14 other EU countries) – Fig. 2e, 2h. Within the latter category, four indicators show zero values: Time to export: Border compliance (hours), Cost to export: Border compliance (USD), Time to import: Border compliance (hours) and Cost to export: Documentary compliance and Cost to import: Documentary compliance (USD). Hence, these indicators each score 100 pts. In Poland, the process of setting up a business involves five procedures, a relatively long time frame of 37 calendar days, a start-up cost of 11.6% of per capita income, and a required minimum capital of 9.3% of per capita income. In recent years, Poland has implemented numerous reforms across the ten indicators measured by Doing Business, such as: Getting electricity: speeding up the procurement of electricity by implementing a new customer service platform to better track requests for new commercial connections (2020), Enforcing contracts: simplifying contract enforcement by introducing an automated system for randomly assigning cases to judges (2019), Dealing with construction permits: streamlining the process of obtaining a construction permit, Getting electricity: expediting electricity connections by eliminating the need for an excavation permit, which shortened the time of the aforementioned work, Resolving Insolvency: facilitating insolvency resolution by introducing new restructuring mechanisms, such as changing the voting procedure for restructuring plans and enabling greater creditor participation in bankruptcy proceedings.

The Czech Republic has the highest number of procedures to start a business - 9, and a long timeframe of 24.5 calendar days, which is twice the EU average. However, the cost of setting up a business is 1.1%, 2.1 percentage points lower than the EU average. The categories of Getting electricity and Getting credit are particularly commendable, with sub-indicator scores



of 95.58pts and 70pts respectively (Fig. 2c, 2e). Their corresponding global rankings are: 3 and 5, respectively. It's worth noting that the minimum paid-in capital as a percentage of per capita income is zero. The cost of obtaining a building permit is 0.20% of the warehouse value, which is 9.5 times lower than in other Union countries<sup>7</sup>. The cost of property registration is 4% of the property value, and the cost of enforcing contracts is 33.8% of the claim value. Positive changes in the Czech Republic that have improved entrepreneurship over recent years include accelerating tax payments by promoting electronic devices (2013), simplifying contract enforcement with changes to the Civil Procedure Code (2015), reducing the cost and time of business registration (2017), expediting electricity acquisition by assigning staff to handle all incoming applications (2017), and reducing business start-up costs by introducing lower fees for limited liability companies (2018). The Czech Republic ranks 15th among EU countries in terms of entrepreneurship, with an index value of 76.34 pts (Fig. 1).

Countries such as the Netherlands, Slovak Republic, Belgium, Croatia, Hungary, Cyprus, Romania, Italy, and Bulgaria form a relatively large group with an entrepreneurship index in the range of  $71.84 \leq Wi < 76.22$ . The Netherlands, ranked 16th, scored an index value of 76.10 pts. The country achieved its highest sub-index values in the Starting a business and Resolving insolvency categories, with respective scores of 94.34 pts and 84.42 pts (Fig. 2a, 2j). Factors like the number of procedures (4), the average business start-up time (3.5 days), and the start-up cost (4%) were favorable. The Slovak Republic achieved its highest sub-indicator values in the Registering property category, with an index value of 90.21 pts. The property registration procedure takes 3 days, and the registration cost is zero. Belgium, ranking 18th among all countries analyzed for entrepreneurial potential, scored 74.99 pts, below the EU average. The country's strengths lie in the Trading across borders (100 pts, shared with 14 other countries) and Resolving insolvency categories (6th place; 84.07 pts). The time to resolve insolvency is less than a year (compared to the EU average of over two years), the cost of the insolvency process is 3.5% of the asset value, and the resolution rate is 1% (the Union average is 1.85 pts). Croatia had the next highest sub-indicator for the Trading across borders category at 100pts. Setting up a business in Croatia involves seven procedures, takes 19.5 days, and costs 6.20% of per capita income (1.9 times the EU average). However, the lowest index was for Getting credit, at 50%. Croatia ranks 51st among global economies (Fig. 1).

Hungary and Cyprus rank 20th and 21st, respectively, in terms of entrepreneurship, with indicator values of 73.42 pts and 73.35 pts. Hungary stands out with a high sub-indicator value in the Getting credit category at 75 pts (Fig. 2e), and a Getting Credit total score of 12 pts (comparable to the EU average of 11.89 pts). The business establishment process in Hungary involves six procedures, takes seven days, and costs 4.5% of per capita income. Cyprus,

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<sup>7</sup> Several methodological assumptions were made about the nature of the property under construction to perform a comparative analysis of results for all 190 economies participating in the study (Doing Business, 2020).

on the other hand, has a high sub-index on Paying taxes at 85.48 pts – Fig. 2g. The combined tax and contribution rate is 22.4% of profit (compared to the EU average of 40.02%). In Cyprus, starting a company involves five procedures, takes six days, and costs 5.60% of per capita income. No minimum share capital is required in this country. Both Hungary and Cyprus have comparable costs for building permits, at 0.6% and 0.9% of warehouse values, respectively.

Countries ranking lower, with relatively low levels of entrepreneurial potential, include Romania, Italy, and Bulgaria. The synthetic index in these countries, as well as in Group III as a whole, was lower than the EU average (76.5%), falling within the range of 73.33-71.97%. Thus, it can be noted that these countries shared a shortfall in entrepreneurial potential compared to the EU average. Among the listed countries, Romania recorded the best results in the categories: Starting a Business (87.68 pts), Paying Taxes (85.22 pts), and Getting Credit (80 pts) – Fig. 2a, 2e, 2g. Establishing a company in Romania takes an average of 20 days and costs 0.3% of the average per capita income. This result is less favorable than the EU average, where setting up a company takes about 12.7 days, even though the cost in Romania is higher at about 3.2% of per capita income. Romania recorded the lowest score for Getting Electricity – 53.67pts (last place in the ranking of EU countries), where the cost of getting electricity accounted for 405.8% of per capita income. The country's entrepreneurship index was 3.17 percentage points lower than the EU average.

In Italy, the sub-indicators for the following categories were the most favorable: Starting a Business (86.81 pts), Getting Electricity (86.08 pts), and Registering Property (81.75 pts) – Fig. 2a, 2c-d. The cost of starting a business in Italy is 13.8% of per capita income, the highest of the three analyzed countries. It should be noted that in Italy (as well as in Bulgaria) the minimum share capital is zero. The cost of registering a property is 4.4% of its value, 0.36 percentage points above the EU average. In the country under study, the contract enforcement process took an average of 1120 days and cost 27.6% of the value of the litigation.

Bulgaria recorded the highest sub-index values for: Trading Across Borders (97.41 pts), Starting a Business (85.40 pts), Dealing with Construction Permits (75.98 pts), and Protecting Minority Investors (74 pts) – Fig. 2a-b, 2f, 2h. The process of establishing a business in Bulgaria involves 21 procedures, which takes about 23 days and costs 1% of per capita income. The cost of registering the property is 2.8% of its value. In Bulgaria, one must follow 18 procedures to obtain a building permit, which takes 97 days (1.85 times less than in the EU) and costs 3.4% of the warehouse value. Bulgaria was ranked 61st in the Doing Business 2020 ranking (Fig. 1).

The last group, with a very low entrepreneurship rate, included Luxembourg (69.60 pts), Greece (68.42 pts), and Malta (66.14 pts). Luxembourg recorded the highest sub-indices for: Starting a Business (88.83 pts), Getting Electricity (84.31 pts), and Dealing with Construction Permits (83.87 pts) – Fig. 2a-c. Luxembourg's weak position was due, among other things, to the lengthy incorporation process – 16.5 days – and the high value of the required minimum share capital – 17.20% of per capita income (in 11 EU countries no minimum capital is

required). Greece stood out with the highest sub-indicator in the Starting a Business category (96 pts – 1st place) and Getting Electricity (84.74 pts) – Fig. 2a, 2c. The former indicator is a result of the ease of incorporation, meaning that a Greek citizen only has to go through four procedures that take four days and cost 1.5% of per capita income (more than twice lower than the EU average). In contrast, obtaining electricity requires five procedures, takes 51 days, and costs 68.2% of per capita income (EU average is 114.92%).

Lastly, Malta, closes the group of countries with very low levels of entrepreneurship and is at the bottom of the EU's ranking in entrepreneurial potential. The value of the indicator deviates significantly from the EU average, by 10.36 percentage points. Malta achieved high sub-indices for Starting a Business (88.19 pts) and Getting Electricity (79.28 pts) – Fig. 2a, 2c. Both the time to set up a business (20.5 days) and the cost of setting it up (6.7%) were higher for the average Maltese resident than the EU average (by 8.3% and 3.5%, respectively).

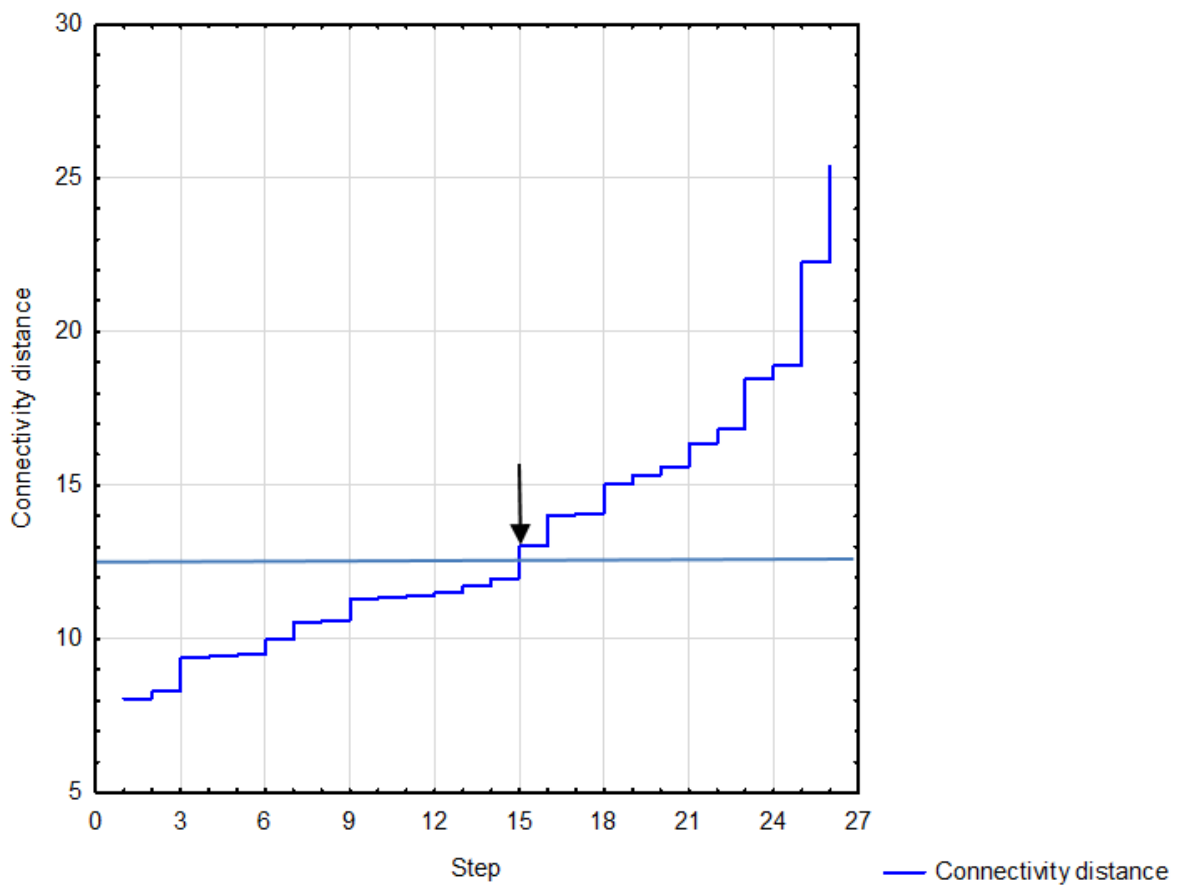
In summary, the analysis conducted shows disparities in the level of entrepreneurship among EU countries. The spatial inequality is evidenced by the gap between the leader of the ranking and the country closing the classification, which is 19.15pts, as well as the number of territorial units in each group. In 2020, countries with the highest and high levels of entrepreneurship were the more numerous group (15), while countries representing Group III and IV accounted for 12 territorial units.

## **5. Grouping European Union countries by level of entrepreneurship using Ward's method**

A multivariate analysis using Ward's method was employed to complement the analysis on the level of entrepreneurship in EU countries using the ease of doing business index. This method was used to comprehensively assess the level and diversity of entrepreneurship across EU member states. Based on it, potentially homogeneous groups of EU member states were distinguished by characteristics describing entrepreneurial potential. Countries belonging to the same group were considered similar in terms of the analyzed characteristics. Indicators from the Doing Business Data Bank (Doing Business 2020) were used to create a typology of countries by the level of entrepreneurship thus defined. The results of the classification carried out using Ward's method are shown as a dendrogram (Fig. 4). The number of groups was determined based on the agglomeration flow chart, which presents the bond distances that define the successively formed classes (Fig. 3).

Ten clusters were distinguished based on this data (Fig. 4). The classification of countries resulted in the formation of single, double, triple, and quadruple element groups. The first typological class consisted of Austria, Belgium, Spain, and Portugal. These countries were characterized by scoring above 70 pts in the "Dealing with Construction Permits" category.

They also shared similar traits in the following categories: Minimum Outage Time in the "Acquiring Electricity" category, Total Tax and Contribution Rate (% of Profit), Profit Tax (% of Profit), and Cost (% of Claim) in the "Resolving Insolvency" category.



**Figure 3.** Diagram of the course of agglomeration for 2020.

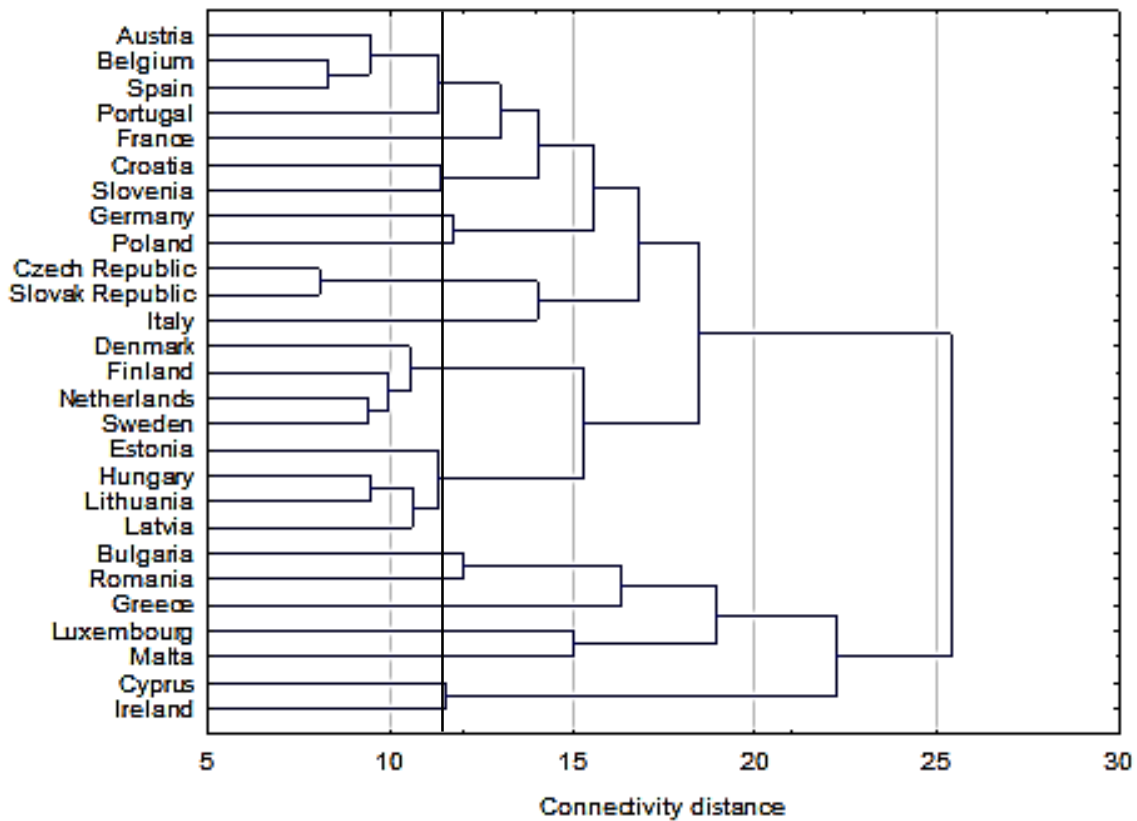
Source: own compilation based on Doing Business database.

France formed the second typological class. The distinctiveness of this cluster probably resulted from the highest value for the Total Tax and Contribution Rate characteristic in the "Paying Taxes" category.

The clustering indicated a similarity in entrepreneurship levels between Croatia and Slovenia, forming cluster 3. Both countries reported similar trait values for the Cost (% of property value) for the Registering property category, Cost (% of claim) for the Enforcing contracts category.

Germany and Poland formed the fourth typological class, characterized by their similarity in Court Fees (% of Claim) and Enforcement Fees (% of Claim) for the "Enforcing Contracts" category. Both countries fall within the group with high levels of entrepreneurship.

The fifth group included two "New" EU countries: the Czech Republic and the Slovak Republic. These countries demonstrated similarities in "Starting a Business", Cost (% of Warehouse Value) in the "Dealing with Construction Permits" category, and selected characteristics in "Paying Taxes". Both countries achieved an entrepreneurship index value below the EU average.



**Figure 4.** Clusters of EU countries with similar levels of entrepreneurship in 2020.

Source: own compilation on Doing Business database.

The sixth group only included Italy, which was notable for having the highest startup cost ("Starting a Business") and the highest Total Tax and Contribution Rate (% of Profit) in the "Paying Taxes" category.

The seventh group consisted of four "Old" EU countries, namely Denmark, Finland, the Netherlands, and Sweden. The cost (% of Warehouse Value) for the "Enforcing Contracts" category, the Strength of Insolvency Framework Index in the "Resolving Insolvency" category, the Quality of Land Administration Index in the "Registering Property" category, and the number of procedures for starting a business were all at similar levels in these countries.

The eighth class included Estonia, Hungary, Lithuania, and Latvia. These countries stood out mainly for their low values within the "Starting Business" category, i.e., the number of procedures, time, and cost of starting a business. Hence, these countries achieved high sub-indices for this category, respectively: 95.36 pts, 88.19 pts, 93.27 pts and 94.14 pts. They also reported a low cost of obtaining a building permit.

Bulgaria and Romania formed the ninth group. They were characterized by a large number of procedures and a long time required to set up a business, a low cost associated with setting up a company, a low level of required share capital (zero for Bulgaria), and a high cost of enforcing contracts.

The tenth, eleventh, and twelfth groups consisted of single-element sets, namely Greece, Luxembourg, and Malta, distinguished by the following: a) Greece was characterized by a large number of procedures (17) and a long time to obtain building permits (180 days), and an average cost of registering the transfer of real estate; b) Luxembourg was notable for a very low cost of obtaining building permits, the highest number of tax payments per year ("Paying Taxes"), and a low cost of enforcing contracts; c) Malta recorded an above-average cost of establishing a business, a very long time to deal with building permits, and the highest cost in the EU of registering the transfer of real estate (13.5% of the property value).

The thirteenth focus included: Cyprus and Ireland. These countries were categorized into this group based on having no minimum share capital, an above-average cost of registering the transfer of real estate, and a low combined tax and contribution rate (% of profit).

## 6. Conclusions

Entrepreneurship is a key driver of innovation and competitiveness among countries and plays a significant role in evaluating the level of socio-economic development of territories and the living standards of local communities. Therefore, understanding the nature of spatial variation in entrepreneurship, which greatly influences the socio-economic development of these territories, is crucial.

The carried-out analysis leads to the following conclusions:

EU countries demonstrate substantial variation in entrepreneurship levels. The gap between the highest-ranking countries and those trailing indicates notable territorial inequalities in entrepreneurial potential. Using a synthetic index to measure entrepreneurship, the distance between the leading country (Denmark) and the lowest-ranked country (Malta) was found to be 19.15 points. In 2020, the majority of EU countries exhibited high levels of entrepreneurship (15 out of the total).

Using this synthetic index, an effort was made to identify the disparities in entrepreneurship levels among member countries. Countries with an above-average synthetic index were regarded as having an entrepreneurial advantage, while those with a below-average synthetic index were viewed as facing an entrepreneurial gap. Out of the 27 member countries, twelve had a synthetic index higher than the EU average, ranging from 1.2 times (Denmark) to equal to the average (Slovenia), demonstrating their entrepreneurial advantage. Conversely, fifteen countries had an index below the EU average, indicating an entrepreneurial deficit.

It is important to note that the study's results were impacted by the COVID-19 pandemic, which severely disrupted the business environment in 2020, including the temporary closure of several business sectors. This led many to hesitate to start new ventures, as existing businesses grappled to stay afloat. The EU economy experienced a decline of nearly 2.4 million jobs in 2020, marking a 1.8% decrease compared to 2019.

Enhancing the business environment can effectively maintain high levels of entrepreneurship and lay a robust foundation for sustainable development. EU member states should intensify efforts to foster a conducive business climate and environment. Measures include reducing the time, number of procedures, and costs of starting a business; tailoring the financial and tax system to suit entrepreneurs' needs; and eliminating unnecessary regulations and excessive bureaucracy to lower operating costs. The study confirmed that EU countries are implementing reforms to improve the business environment and, consequently, increase entrepreneurship levels.

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