

## MEASURING REGIONAL COMPETITIVENESS AT THE LEVEL OF THE EUROPEAN UNION

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***Abstract:** Competitiveness is a concept with multiple meanings, which led to the appearance of an important number of definitions: we encounter the concept of competitiveness at the national level, but also at the company level. Competitiveness considers all the elements that explain the success of a nation, from a global perspective. Competitiveness looks at how both nations and firms use the totality of their skills to achieve prosperity and profit. Competitiveness is relative and not absolute because it compares the performances of nations or companies with each other. The competitiveness of a country is one of the main aspects that ensure the country's evolution at the regional and even global level. The sources of competitiveness may differ for a country depending on its economic, political, cultural position, but also on the group of countries to which it refers. Since 2010, the European Union Regional Competitiveness Index measures the main competitiveness factors for all NUTS-2 level regions in the European Union. The index measures, with the help of a set of indicators, the ability of a region to offer an attractive environment for companies and residents. Starting in 2022, this index is based on an updated RCI 2.0 methodology.*

***Keywords:** competitiveness, European Union, updated RCI 2.0 methodology, performance.*

***JEL Classification:** F15, F10.*

### 1. Introduction

In the history of economic thought, the concept of competitiveness has evolved from the classical mercantilist theory to the theory of competitive advantages and to the neoclassical criticisms of the international competitiveness of countries. (Voinescu, Moisoiu, 2015) shows that more recent theories have developed the concept of regional competitiveness, bringing classical theories closer to the applied economy of regions. The European Commission has adopted the objectives of the regional competitiveness policy as the main tool for inducing economic growth, export capacity and performance on the global market. Other studies on the international competitiveness of regions have brought the discussion of competitiveness to the dimension of relations between regions. The theoretical origins of the concept of competitiveness can be traced to the economics of foreign trade and its role in national and international economic well-being.

### 2. Measuring regional competitiveness at the level of the European Union

According to (Dijkstra et al., 2023), regional competitiveness is defined as the ability of a region to provide an attractive and sustainable environment for firms and residents to live and work. The authors point out that their definition of regional competitiveness is slightly different because it integrates the perspective of both businesses and residents. This definition balances the goals of business success with those of societal well-being and answers, at least in part, the "beyond GDP" discussion. In the definition provided, the concept of sustainability refers to the ability of the region to provide an attractive environment in both the short and long term. For example, by including numerous indicators on human capital and the quality of institutions, the RCI is meant to measure a region's long-term potential.

Since 2010, the EU Regional Competitiveness Index (RCI) measures the main competitiveness factors for all NUTS-2 level regions in the European Union. This index measures, with a considerable set of indicators, the ability of a region to provide an attractive environment for companies and residents to live and work. The 2022 edition of the index is

based on an updated methodology called RCI 2.0. RCI has become a widely used index since its first edition, RCI 2010 (Dijkstra et al., 2011). If in the first editions the focus was on highlighting the differences in competitiveness between regions at a given time, in the following editions an attempt was made to record the significant changes that occurred over time. This change in optics encountered several difficulties: the list of indicators changed over time; some indicators are no longer collected or relevant and new indicators have been added to capture new issues. In addition, changes in the Nomenclature of Territorial Units of Statistics (NUTS) 2 regions in Croatia, Ireland, Lithuania and Poland created breaks in the statistical time series. In addition, there have also been changes regarding the member states of the European Union. To avoid the pandemic influencing the underlying drivers of competitiveness, 2019 data was used for certain indicators instead of 2020 or 2021.

Until 2018, the RCI followed the approach used by the World Economic Forum (WEF) to construct the Global Competitiveness Index (GCI), after which the index has been substantially modified. Building on the WEF's Global Competitiveness Index (GCI) framework, RCI has adapted this framework and extended it to the EU regional context, with the aim of capturing the underlying factors that underpin a region's long-term economic development. This index does not aim to capture the impact of short-term shocks (eg the COVID-19 pandemic or the invasion of Ukraine).

Figure no. 1. RCI 2.0 structure



Source: Dijkstra et al., 2023, p.8

The RCI 2.0 Regional Competitiveness Index is composed of three sub-indices: "core", "efficiency" and "innovation" and 11 pillars describing the different aspects of competitiveness. The structure has remained unchanged since the first edition in 2010.

The "core" sub-index refers to the main underlying drivers of all types of savings. It identifies the main issues that are necessary for the development of regional competitiveness and includes five pillars: (1) 'Institutions', (2) 'Macroeconomic Stability', (3) 'Infrastructures', (4) 'Health' and (5) 'Education Basic'.

The "Institutions" pillar captures the quality and efficiency of institutions, the perceived level of corruption and the overall regulatory framework within countries. It shows whether the institutional climate supports entrepreneurship and whether it is easy to start a new business. It captures the extent to which people trust their national legislative and regulatory

systems and whether managers believe that various aspects of the business environment are effective and trustworthy.

"Macroeconomic stability" measures the quality of the overall economic climate. Economic stability is essential to guarantee confidence in markets, both for consumers and for producers of goods and services. Stable macroeconomic conditions lead to a higher rate of long-term investment and are essential ingredients for maintaining competitiveness.

The "Infrastructure" pillar describes dimensions of infrastructure quality such as connectivity and accessibility. The quality of infrastructure is essential for the efficient functioning of an economy. High-quality infrastructure guarantees easy access to other regions and countries, contributes to better integration of peripheral and lagging regions, and facilitates the transport of goods, people and services. This has a strong impact on competitiveness as it increases the efficiency of regional economies.

The "Health" pillar describes human capital in terms of health and well-being, with a particular focus on the workforce. Good population health leads to greater labor market participation, longer working lives, higher productivity, and lower health and social costs.

The "Basic Education" pillar focuses on compulsory education results as an indication of the effectiveness and quality of the educational system in the EU member states. High levels of basic skills and competences increase the ability of individuals to subsequently perform well in their work and continue into tertiary education.

The 'Efficiency' sub-index includes three pillars: (6) 'Higher education, training and lifelong learning', (7) 'Labour market efficiency' and (8) 'Market size'. As a regional economy develops, these aspects are linked to a more skilled workforce and a more efficient labor market.

The pillar "Higher education and lifelong learning" captures the contribution of education to productivity and economic growth. Knowledge-based, innovation-driven economies require well-educated, adaptable human capital and education systems that successfully impart key skills and competencies. "Labor market efficiency" provides an important indication of economic development of a region. Efficient and flexible labor markets contribute to the efficient allocation of resources.

"Market size" aims to describe the size of the market available to firms, which directly influences their competitiveness. In fact, larger markets allow firms to grow and benefit from economies of scale and could stimulate entrepreneurship and innovation.

Finally, the sub-index "Innovation" includes the three pillars that are engines of improvement at the most advanced stage of economic development: (9) "Technological Readiness", (10) "Business Refinement" and (11) "Innovation" .

"Technological readiness" measures the extent to which households and businesses use and adopt existing technologies.

The adoption and diffusion of new technologies is widely regarded as fundamental to driving growth and competitiveness.

The next pillar is "Business Sophistication". The level of business sophistication within an economy shows its potential for specialization and diversification, which can help regions respond to competition. Specialization in sectors with high added value also contributes to competitiveness.

The last pillar is "Innovation". Developed economies need to be at the forefront of new technologies, producing state-of-the-art products and processes to maintain their competitive advantage. The level of innovative capacity of a region influences the ways in which technology is diffused in the region.

Given the nature and availability of the indicators, two of the pillars - "Macroeconomic Stability" and "Basic Education" - are measured at the national level, while the "Institutions"

and "Technological Training" pillars include two sub-pillars, one at the national level and one at the regional level.

Unlike previous editions, the EU regions are divided into three development stages according to the average gross domestic product (GDP) per capita 2018–2020 in purchasing power standards (PPS), expressed as an index with the EU-27 average set as reference level 100. In the three previous editions of the RCI – 2013, 2016 and 2019, EU regions were divided into five stages of development, in the same way as the Global Competitiveness Index (WEF-GCI) did until its edition 2017/2018. Since then, WEF-GCI no longer uses development stages. Consequently, RCI 2.0 returned to the original approach used in the 2010 edition of using three stages, adapting them to the thresholds used in cohesion policy today. These development stages are recalculated for each edition and do not fully correspond to the category of regions used by cohesion policy programmes.

**Figure no. 2. Weighting of RCI sub-indices according to development stage**

Stage of development	Sub-index weights	
	Basic	Efficiency
Stage 1: GDP index (*) < 75	30 %	50 %
Stage 2: GDP index (*) [75-100]	25 %	50 %
Stage 3: GDP index (*) > 100	20 %	50 %

Source: Dijkstra et al., 2023, p.8

The calculation methodology of RCI 2.0 2022 is based on 68 indicators, of which 48 are at the regional level. Of the 68 indicators, 51 were used in the two previous editions, 9 were used in one of the two previous editions and 8 are new. These were primarily indicators at the national level in the pillars "Institutions" and "Technological Preparation". In general, the index follows the methodology adopted in the first edition in 2010, but some adjustments and updates have been made.

**The main steps used to build the RCI:**

1. Check for missing data
2. Outlier detection
3. Normalization
4. Weighting
5. Aggregation
6. Conversion to an EU index.

Regarding this conversion, (Dijkstra et al., 2023) states that finally, to facilitate the interpretation of the RCI and to make it more accessible to a less technical audience, we transformed the final scores of the overall RCI, sub-indices and pillars into an EU index, by expressing each value as a percentage of the EU average. This is done using the following formula:

$$x_{new} = 100 + \left( \frac{x - EU-27}{EU-27} \times 100 \right)$$

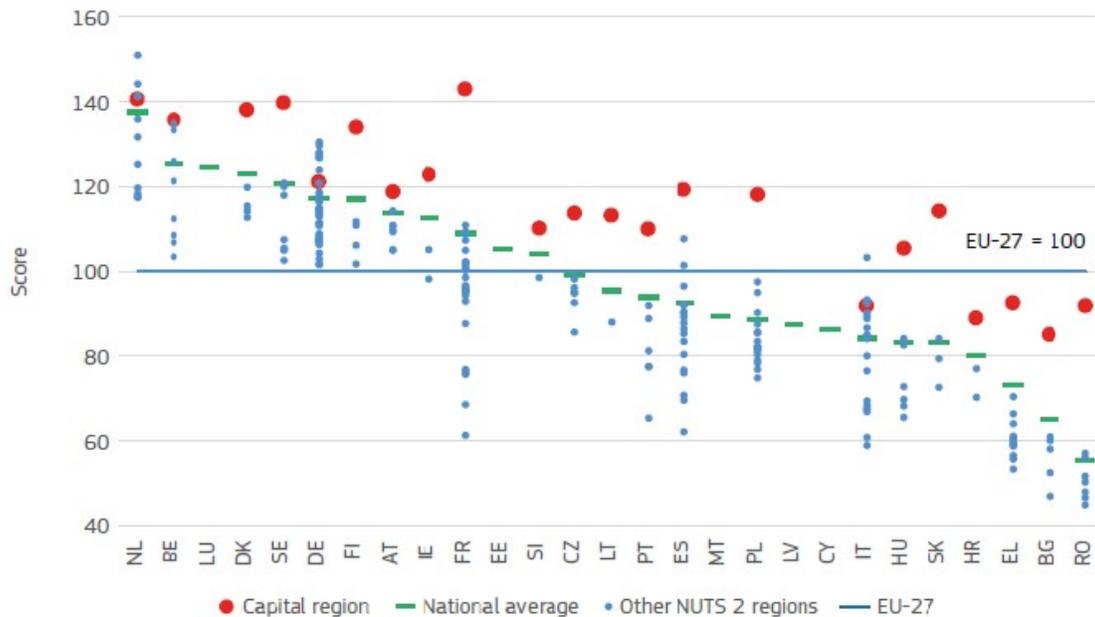
Thus, 100 represents the EU-27 average for the index, sub-indices and each pillar. A region value of 90% means that region scores 90% of the EU average, while a value of 120 means the region scores 20% above the EU average.

### 3. RCI 2022: main findings at European Union level

RCI reveals a remarkable spatial pattern across EU regions. Regional competitiveness is above the EU average in all regions of Austria, Benelux, Germany and the Nordic Member States. In contrast, all eastern regions, except most capital regions, score below the EU average. Southern regions of EU member states tend to score below the EU average, with only five exceptions: Cataluña, Madrid and País Vasco in Spain, Lombardy in Italy and Área Metropolitana de Lisboa in Portugal. Ireland and especially France have a mix of regions above and below the EU average.

In line with previous editions, RCI 2022 shows a polycentric pattern, with a strong performance of regions hosting large urban areas in the EU benefiting from economies of agglomeration, better connectivity and higher levels of human capital.

Figura nr. 3. Regional variation by Member State



Source: Dijkstra et al., 2023, p.12

Within Member States, capital regions tend to be the most competitive. The gap between the capital region and the remaining regions is particularly large in France, Spain and Portugal and in many of the EU's eastern Member States. This can be a cause for concern as it puts pressure on the capital region, leaving resources in other regions underutilized.

In three countries, capital regions are not the most competitive: Germany, Italy and the Netherlands. In the Netherlands, the best performing region remains Utrecht (at 151 of the EU average), followed by Zuid-Holland which includes Rotterdam and The Hague (at 144). In Italy, Lombardy, which includes Milan (at 103), continues to be the best performing Italian region. In Germany, the best-performing region remains Oberbayern, which includes Munich (at 130).

The best performing RCI 2022 is the Utrecht region (Netherlands), followed by Zuid-Holland (Netherlands) and the Île-de-France region. All have at least 40 points above the EU

average (EU-27 = 100). Overall, among the 10 best performing regions we find five Dutch regions (including the capital region Amsterdam and its commuting area), two Belgian regions (including the capital region Brussels and its commuting area) and the three capital regions of Denmark, France and Sweden.

**Figure no. 4. Top 10 best performing regions**

TOP 10				
Member State	Region code	Region name	RCI 2.0 - 2022 (EU-27 = 100)	Rank
Netherlands	NL31	Utrecht	150.9	1
Netherlands	NL33	Zuid-Holland	144.1	2
France	FR10	Île-de-France	142.8	3
Netherlands	NL41	Noord-Brabant	141.4	4
Netherlands	NL_C	Amsterdam and its commuting zone	140.5	5
Sweden	SE11	Stockholm	139.7	6
Denmark	DK01	Hovedstaden	138.1	7
Netherlands	NL22	Gelderland	136.0	8
Belgium	BE_C	Brussels and its commuting zone	135.7	9
Belgium	BE23	Oost-Vlaanderen	134.8	10

Source: Dijkstra et al., 2023, p.14

At the other end of the scale, with 50 or more points behind the EU average, we find six Romanian regions, two Greek regions and two Bulgarian regions. The last 10 regions do not include any capital region.

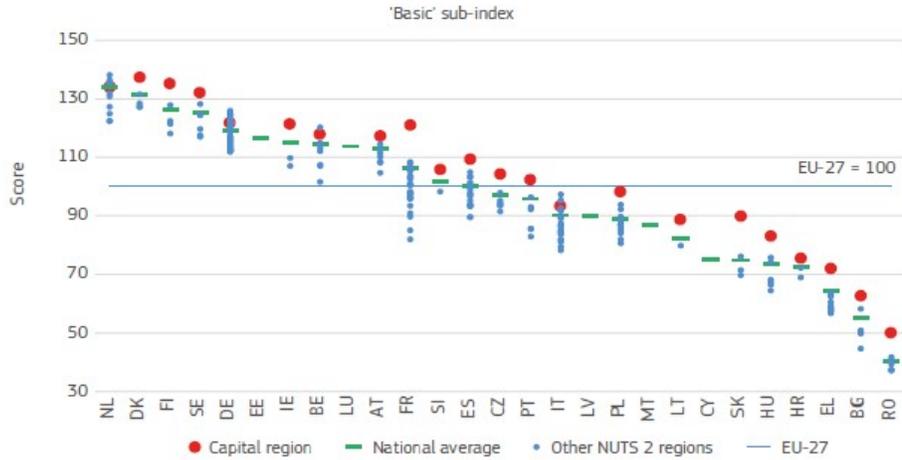
**Figure no. 5. The last 10 lowest performing regions**

BOTTOM 10				
Member State	Region code	Region name	RCI 2.0 - 2022 (EU-27 = 100)	Rank
Romania	RO11	Nord-Vest	56.1	225
Greece	EL51	Anatoliki Makedonia, Thraki	55.8	226
Greece	EL64	Sterea Elláda	53.4	227
Bulgaria	BG34	Yugozhahari	52.6	228
Romania	RO31	Sud-Muntenia	51.6	229
Romania	RO12	Centru	50.4	230
Romania	RO41	Sud-Vest Oltenia	47.9	231
Bulgaria	BG31	Severozapaden	46.9	232
Romania	RO21	Nord-Est	46.6	233
Romania	RO22	Sud-Est	44.9	234

Source: Dijkstra et al., 2023, p.14

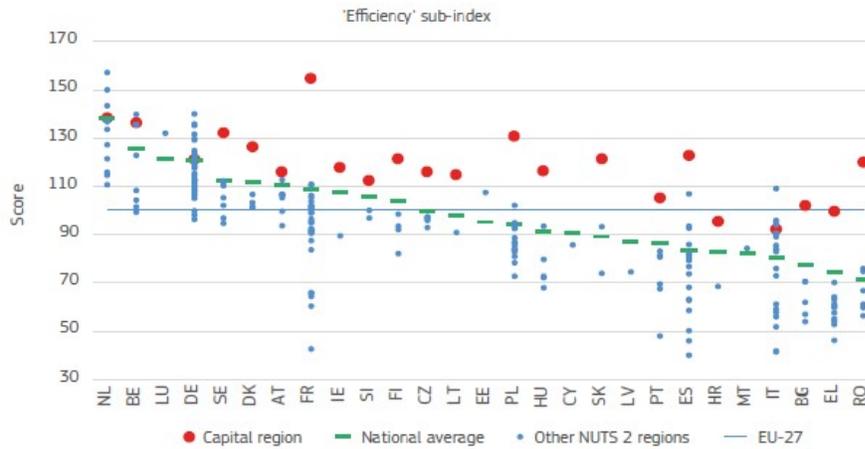
Regarding the spatial distribution of the "core", "efficiency" and "innovation" sub-indices, the "core" sub-index shows the least within-country variability, while the "efficiency" and especially the "innovation" sub-indices it varies more.

**Figure no. 6. Spatial distribution of the "base" subindex**



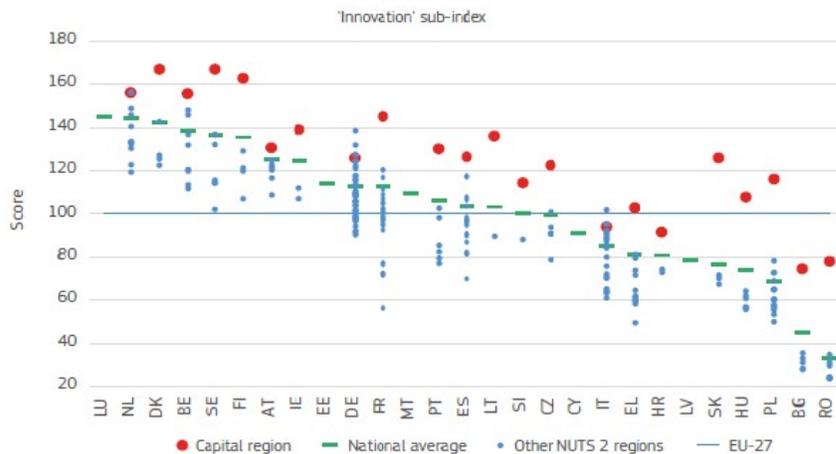
Source: Dijkstra et al., 2023, p.16

**Figure no. 7. Spatial distribution of the "efficiency" sub-index**



Source: Dijkstra et al., 2023, p.16

**Figure no. 8. Spatial distribution of the "innovation" sub-index**



Source: Dijkstra et al., 2023, p.16

The variation in scores increases from the "core" to "innovation" sub-index between countries and even more so within countries. The within-country variation and the gap between the capital region and the rest of the regions in a country are larger in the more advanced components of competitiveness – that is, in the 'Efficiency' and 'Innovation' sub-indices.

The use of the classification of regions according to the stage of development highlights the link between development and competitiveness. On average, more developed regions (with a GDP per capita above 100% of the EU average) perform better than those in transition (between 75% and 100%) and less developed regions (with a GDP per capita less than 75 %) in total RCI components.

The gap between more and less developed regions is largest for the sub-index "Innovation" and its pillars. Some of the core pillars, such as 'institutions' and 'infrastructure' (measured mainly in the RCI by accessibility), also reveal a large gap between less developed and more developed regions.

#### 4. Conclusions

In a globalized and interdependent economy, economies face various risks and opportunities related to competitiveness. At the national level, policymakers pay increasing attention to various international competitiveness rankings and aim to improve their country's relevant policies in search of competitiveness gains. At the global level, international economic organizations consider increasing the competitiveness of nations as a prerequisite for the stability and growth of the global economy and for the deeper integration of developing economies into international economic flows.

There are large differences in regional competitiveness in the EU. The lowest values are concentrated in the eastern regions of the EU Member States, followed by those in the southern EU Member States. All regions in Austria, Benelux, Germany and the three Nordic Member States score above average. The capital region tends to be the most competitive in the country, with only a few exceptions (Germany, Italy and the Netherlands). The gap between the capital region and the rest, however, varies, with particularly large gaps seen in France, Romania and Slovakia. Between 2016 and 2022, regional competitiveness improved in less developed regions, while the performance of transition regions was more varied. More developed regions continued to have the highest scores, but converged towards the EU average.

As an aggregate measure of different factors of competitiveness, higher levels of RCI can only be achieved by achieving higher scores in all 11 pillars. High performance can only be achieved thanks to a set of factors acting simultaneously.

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