



Article Evaluating Experts' Perceptions on Regional Competitiveness Based on the Ten Key Factors of Assessment

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Abstract: In the contemporary landscape, the foundation of competitive advantage lies in sustainability, particularly within the context of regional competitiveness. This topic explores the impact of sustainability on regional competitiveness. In this study, we assessed experts' opinions on the impact of the main ten key factors of evaluation on regional competitiveness, namely the economy, labor market, poverty and social inclusion, health, education, environmental and energy considerations, transport infrastructure, science and technology, high-tech industries, and innovation. The study aims to understand how these factors influence regional competitiveness. A sample of 93 experts participated in a questionnaire survey through the Google platform from October to December 2023. This methodology was chosen to gather diverse expert opinions efficiently. The collected data were analyzed with statistical tools, combining cross and chi-square tests. Statistical analysis methods such as cross and chi-square tests were employed to analyze the collected data. Our findings indicate that experts recognize the economy (up to a positive level of 69.1%), the labor market (up to 64.7%), and the health infrastructure (up to 52.9%) as the main impact factors on regional competitiveness. Collective efforts and improvements in these factors are essential to alleviate poverty and social exclusion (up to 50.8%). Investments in education (up to 41.9%) and technological science and the digital society (up to 39.2%) are considered key after the main factors to promoting prosperity and competitiveness. Following them, there is a growing call for creating a greener, healthier, and more sustainable future, reflected in the focus on environmental and energy issues (up to 36.7%) and toward transport developments (up to 35.7%). At the bottom of the list are high-tech industry (up to 32.5%) and the innovation factor (up to 28.2%). These factor groups are highlighted as critical aspects for promoting prosperity and addressing social challenges in the region. The findings underscore the multifactorial nature of regional competitiveness, emphasizing both the important and less critical factors. It becomes apparent that the interpretation of regional competitiveness requires a comprehensive analysis of multiple factors, each contributing differently to overall competitiveness. Further examination and analysis are necessary to fully understand these dynamics.

Keywords: sustainability; regional competitiveness; experts; questionnaire; statistical analysis; factors; innovation; health; science; technology; gross domestic product

1. Introduction

In the era of globalization and rapid technological advancement, the concept of regional competitiveness has emerged as a critical determinant of economic growth, social development, and environmental sustainability [1]. Regional competitiveness is defined as a region's capacity to attract investment, foster innovation, and create opportunities for its residents while balancing economic growth with social inclusion and environmental stewardship [2]. Beyond the traditional metrics of gross domestic product (GDP) growth



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Copyright: © 2024 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). and industrial output, regional competitiveness encapsulates the multifaceted dynamics that shape a region's ability to thrive in an increasingly interconnected world [3].

Regional competitiveness reflects a region's capacity to attract investment, foster innovation, and create opportunities for its residents, all while balancing economic growth with social inclusion and environmental stewardship [4]. It embodies the intricate interplay between economic, social, and environmental factors, each contributing to the overall vibrancy and sustainability of a region's economy [5].

The foundation of this study rests on understanding the multifaceted nature of regional competitiveness, which involves the economic, social, and environmental dimensions. To enhance regional competitiveness, it is crucial to understand how the interplay of ten determinants varies across different stages of development [6]. Developed and less developed countries face unique challenges and opportunities regarding these factors. This study aims to contribute to gaining clarity on these dynamics by examining experts' perspectives on regional competitiveness within various contexts [7].

We have reviewed the recent literature and found that ten pivotal factors have emerged from our analysis of the recent literature, encompassing the economy, labor market, poverty and social inclusion, healthcare, educational infrastructure, environmental considerations, transportation infrastructure, science and technology, high-tech industries, and innovation [8].

This paper is organized to first review the literature on regional competitiveness and its key factors. Then, it explains how data were collected and describes the methods used. Next, it presents and discusses the results. Finally, it concludes by summarizing findings, acknowledging limitations, and suggesting areas for future research.

Literature Review

The economy of a region extends beyond mere GDP figures, encompassing factors such as industrial diversity, innovation capacity, and resilience to external shocks [9]. A robust economy is characterized by a diverse industrial base, a supportive regulatory environment, and investments in research and development [10]. It thrives on a diverse industrial base, fostering a mosaic of sectors that collectively drive growth and stability [11]. Moreover, it relies on a regulatory framework that nurtures entrepreneurship and innovation, serving as a catalyst for sustained prosperity [12].

The labor market serves as a dynamic arena where the presence of a skilled and adaptable workforce is indispensable for sustaining competitiveness in the contemporary knowledge-based economy [13]. Skill development programs and initiatives aimed at enhancing workforce adaptability are crucial in meeting the evolving demands of industries. Beyond the traditional lens of unemployment rates, a nuanced exploration reveals a multitude of factors that intricately shape the labor market landscape [14]. Workforce participation rates offer insights into the level of engagement and productivity within the labor force, reflecting the vibrancy of economic activity within a region [15].

In the realm of poverty and social inclusion, entrenched social disparities can erode a region's competitiveness, acting as formidable barriers that restrict access to fundamental pillars of development such as education, healthcare, and economic opportunities [16]. Strategic social policies and targeted interventions are essential in breaking the cycle of poverty and promoting inclusive economic growth. Tackling poverty and fostering social inclusion necessitates strategic and concerted efforts, targeting interventions that directly confront the roots of inequality [17].

Health stands as the cornerstone of societal vitality and prosperity, serving as the bedrock upon which economic productivity and human capital development flourish [18,19]. Investments in healthcare infrastructure and preventive healthcare programs not only improve public health outcomes but also contribute to economic productivity gains. Recognizing this, investments in healthcare infrastructure, disease prevention, and robust public health initiatives are indispensable for fostering thriving communities and bolstering overall wellbeing [20].

Education is crucial for offering individuals the essential skills and knowledge required to thrive in the complexities of the modern economy [21]. Improving educational access and quality is pivotal in unlocking human capital potential and driving sustainable economic development. Beyond merely imparting basic literacy, the quality and accessibility of education serve as pivotal factors in unlocking a region's human capital potential [22]. Factors such as educational attainment levels, curriculum relevance, and the availability of vocational training programs significantly influence the capability of individuals to contribute meaningfully to economic growth and innovation [23].

Environmental and energy management is integral to long-term competitiveness, as environmental degradation and resource depletion can undermine economic growth and social stability [24]. Adopting sustainable practices and investing in renewable energy technologies are essential in mitigating environmental risks and promoting long-term economic resilience. A region's commitment to environmental stewardship, renewable energy adoption, and pollution reduction measures is indicative of its resilience and forward-thinking approach to development [25].

Efficient transportation networks are essential for facilitating trade, commerce, and mobility within and across regions [26,27]. Improving infrastructure connectivity and accessibility can significantly enhance a region's economic competitiveness and attractiveness to investors. Factors such as infrastructure quality, connectivity, and accessibility play a pivotal role in determining a region's connectivity to global markets and its ability to attract investment [28,29].

Technology and digital society development are key drivers of competitiveness [30]. Beyond basic connectivity, factors such as digital literacy, cybersecurity, and the adoption of emerging technologies shape a region's capacity for innovation and economic growth [31]. Innovation and digitalization initiatives are critical in positioning regions at the forefront of global competitiveness.

High-tech industries support a region's ability to support research and development initiatives and cultivate a culture of innovation and is central to its long-term prosperity [32].

Innovation and entrepreneurship are catalysts for economic dynamism and job creation [33]. Factors such as access to venture capital, the regulatory environment, and support networks for startups and SMEs play a crucial role in fostering an ecosystem conducive to innovation and entrepreneurship [34]. Moreover, creating innovation hubs, fostering collaboration between academia, industry, and government [35], and promoting knowledge-sharing networks can catalyze the flow of ideas, talent, and investment within a region, driving sustained economic growth and competitiveness [36].

The aim of this study is to explore experts' opinions on the ten key determinants of regional competitiveness, building on foundational literature that identifies factors shaping a region's competitive advantage [8]. The ten key determinants that contribute to sustained growth and prosperity and are analyzed in this research work are:

1. Economy	Environment and energy
2. Labor market	7. Transportation
3. Poverty and social exclusion	8. Science/technology and digital society
4. Health	9. High-tech industries
5. Education	10. Innovation

Each of these factors represents critical components that contribute to the foundation of regional competitiveness. They are explored in detail throughout this paper to develop a comprehensive understanding of their individual and collective impacts on regional prosperity and sustainability.

2. Materials and Methods

2.1. Data Collection and Sample Characterization

A questionnaire was developed to investigate the preferences of experts for the ten factors. The survey was conducted between October and December 2023. The questionnaire consisted of 45 questions regarding the ten factors measuring regional competitiveness (Table S1). In each question, we have one pairwise comparison between the ten factors [37,38]. That means that factor 1 compares itself with the other 9 factors, factor 2 with the other 8 remaining factors, factor 3 with the remaining 7, etc. That comes to 45 questions/answers (9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1 = 45). This approach ensured a comprehensive assessment of experts' nuanced opinions on the relative importance of each factor in regional competitiveness.

The utilization of electronic questionnaires served as the primary modality for this research endeavor, owing to its facilitation in distributing the surveys to international experts and in their subsequent return to us. General Data Protection Regulation (GDPR) European Union regulation procedures were followed, and the distribution method involved email dissemination, in which experts were contacted after personal or telephone contacts in order to obtain their permission to receive the related questionnaire, in which the research objectives and the significance of their involvement were elucidated [39]. The respondents' personal data remained safeguarded and unlinked to their respective responses.

Google Forms was employed for the creation and distribution of the questionnaire due to its convenience in collating responses and generating results in an Excel format. The geographical scope of the study encompasses both the regions of Greece and the member states of the European Union. The questionnaires underwent a trial run of 10, with a sample group comprising 93 individuals (out of 120 invitees), to ensure comprehension and clarity of the questions, as well as the integrity of the resulting data. This pilot study phase helped refine the questionnaire and streamline data collection procedures.

The experts were selected based on their relevance and representativeness in the field of regional competitiveness. The sample population, mainly regional policy makers, regional actors, academics, and practicians, was diversely composed, including, among others, economists, who offer expertise in analyzing economic data and regional development indicators [40]; geographers, who provide insights into spatial aspects of regional development and economic geography [41]; statisticians, who assist in questionnaire design, analysis, and result interpretation [42]; data and modeling specialists, who devise models for gauging and evaluating regional competitiveness [43]; and development and competitiveness [44].

2.2. Data Analysis

The questionnaires underwent analysis and statistical data processing was conducted using IBM SPSS Statistics for Windows (Version 25.0, IBM Corp., Armonk, NY, USA), a widely recognized software package for statistical analysis, as elaborately delineated in prior discussions [45].

IBM SPSS Statistics is a robust statistical software package renowned for its versatility and comprehensiveness in data analysis [46]. Leveraging its array of analytical tools, including descriptive statistics, correlation analysis, regression analysis, and more, facilitated the meticulous examination of the questionnaire responses and the derivation of meaningful insights [47].

Chi-square (χ^2) tests and *p*-value significance assessments were performed to determine the statistical significance of the results [48]. The utilization of these methodological approaches ensured a systematic examination of the data, enabling the extraction of valuable insights regarding the preferences of experts regarding the indicators under consideration. While statistical methods were rigorously applied, the specific validation procedures for the responses were not explicitly detailed in the methodology.

A comprehensive statistical analysis was conducted on a questionnaire comprising 45 questions, employing pairwise comparisons (Table S2). As discussed, the aim was to capture the expertise/opinions of the experts on how much more or how much less important factor X is against factor Y.

Descriptive statistics were computed to summarize the central tendency and variability of responses. The mean values across all questions ranged from 4.09 to 4.74, indicating the average score assigned by respondents to each item.

The median values consistently stood at 5 for all questions. The median, being a robust measure of central tendency, suggests that, on average, respondent's attitudes tended towards neutrality or sight agreement with the presented statements.

Standard deviation values, ranging from 1.33 to 1.69, provided insights into the dispersion of responses around the mean.

Furthermore, the minimum scores for all questions were 1, indicating that at least one respondent assigned the lowest possible score, while the maximum scores uniformly reached 7, implying that at least one respondent assigned the highest possible score for each item.

3. Results

The results presented in the following tables pertain to the ten main factors concerning regional competitiveness. Numerical results and percentages were obtained by summing the percentages of responses to each question and dividing by the average of the factors. Specifically, by summing the columns "Not at all", "Much too little", and "Barely too little", we create the "Negative—Columns Sum". Summing the columns "Very", "Very much", and "Absolutely", we create the "Positive—Columns Sum". Thus, for each factor, we have its percentage in relation to the others. For each factor, we calculate the average of the percentages of the "Positive—Columns Sum" in comparison to the other nine factors. For the reverse comparisons, we use the percentages of the "Negative—Columns Sum" to calculate the average in relation to the nine other factors.

In Table 1, regarding the first factor, the economy, the highest comparison value is with the environment and energy factor (75.4%), followed closely by a small difference from the education factor (75.2%) and science, technology, and digital society (74.3%). Health (68.9%) and innovation (68.9%) are followed by an equal degree in their percentage. Similarly, the factors poverty and social exclusion (65.6%), transportation (65.6%), and high-tech industry (65.6%) are placed after in a tie for third. The labor market (62.4%) ranks last among the compared factors.

Factor 1. Economy									
How Important Is the Factor of Economy Compared to:	Not at All	Much Too Little	Barely Too Little	Columns Sum (Negative)	Equal Value	Very	Very Much	Absolutely	Columns Sum (Positive)
Labor Market:	10.8 *	15.1	6.5	32.4	5.4	52.7	4.3	5.4	62.4
Poverty and Social Exclusion:	6.5	17.2	6.5	30.2	4.3	54.8	5.4	5.4	65.6
Health:	6.5	11.8	9.7	28.0	3.2	58.1	6.5	4.3	68.9
Education:	4.3	5.4	7.5	17.2	7.5	54.8	12.9	7.5	75.2
Environment and Energy:	5.4	9.7	5.4	20.5	4.3	62.4	6.5	6.5	75.4
Transport:	11.8	11.8	5.4	29.0	5.4	53.8	8.6	3.2	65.6
Technology, Science, and Digital Society:	4.3	5.4	7.5	17.2	8.6	53.8	9.7	10.8	74.3
High-tech Industry:	10.8	12.9	5.4	29.1	5.4	58.1	3.2	4.3	65.6
Innovation:	6.5	10.8	5.4	22.7	8.6	58.1	6.5	4.3	68.9
Average:									69.1

Table 1. Expert evaluation of the impact of the economy factor on regional competitiveness.

* Values represent %.

In Table 2, for the second factor, the labor market, the highest percentage is with environment and energy (81.8%), which is the same as for the economy factor. Following that, the highest comparison value is with education (73.2%), with a slight difference

compared to the transport factor (72.1%). The poverty and social exclusion factor comes next, with a percentage of (66.7%). The health (65.6%) and -tech industry (65.6%) factors are tied for the subsequent position. At the bottom of the list, with no difference between them, are the technology, science, and digital society factor (62.4%) and the innovation factor (62.3%). The reverse comparison with the economy has a percentage of 32.4%.

Table 2. Expert evaluation of the impact of the labor market factor on regional competitiveness.

Factor 2: Labor Market									
How Important Is the Factor of Labor Market Compared to:	Not at All	Much Too Little	Barely Too Little	Columns Sum (Negative)	Equal Value	Very	Very Much	Absolutely	Columns Sum (Positive)
Poverty and Social Exclusion:	6.5 *	8.6	7.5	22.6	10.8	55.9	5.4	5.4	66.7
Health:	9.7	10.8	5.4	25.9	8.6	58.1	4.3	3.2	65.6
Education:	3.2	12.9	5.4	21.5	5.4	58.1	6.5	8.6	73.2
Environment and Energy:	4.3	12	6.5	22.8	4.3	65.5	9.8	6.5	81.8
Transport:	6.5	11.8	3.2	21.5	6.5	58.1	4.3	9.7	72.1
Technology, Science, and Digital Society:	7.5	15.1	7.5	30.1	7.5	55.9	4.3	2.2	62.4
High-tech Industry:	4.3	16.1	11.8	32.2	2.2	54.8	6.5	4.3	65.6
Innovation:	6.5	8.6	10.8	25.9	11.8	54.8	4.3	3.2	62.3
** Economy:									32.4
Average:									64.7

* Values represent %. ** Reverse comparison taken from above factor table.

In Table 3, for the third factor, poverty and social exclusion, the highest percentage is with education (70.9%). Following closely, with a small difference, is the comparison with environment and energy (69.9%). The transport factor comes next, with a percentage of 66.7%. The next factors, with a small difference between them, are innovation (64.5%) and high-tech industry (61.4%). At the bottom of the list are the health factor, with a percentage of 53.5% and, lastly, the factor of technology, science, and digital society (17.3%). The reverse comparisons with economy and labor market have percentages of 30.2% and 22.6%, respectively.

Table 3. Expert evaluation of the impact of the poverty and social exclusion factor on regional competitiveness.

Factor 3: Poverty and Social Ex	clusion								
How Important Is the Factor of Poverty and Social Exclusion Compared to:	Not at All	Much Too Little	Barely Too Little	Columns Sum (Negative)	Equal Value	Very	Very Much	Absolutely	Columns Sum (Positive)
Health:	6.5 *	7.5	5.4	19.4	17.2	45.9	6.5	1.1	53.5
Education:	5.4	12.9	5.4	23.7	5.4	59.1	4.3	7.5	70.9
Environment and Energy:	5.4	7.5	7.5	20.4	9.7	55.9	9.7	4.3	69.9
Transport:	3.2	15.1	7.5	25.8	7.5	53.8	4.3	8.6	66.7
Technology, Science, and Digital Society:	6.5	7.5	59.1	73.1	9.7	6.5	4.3	6.5	17.3
High-tech Industry:	7.5	18.3	6.5	32.3	6.5	53.8	5.4	2.2	61.4
Innovation:	7.5	14	6.5	28	7.5	54.8	4.3	5.4	64.5
** Economy:									30.2
** Labor Market:									22.6
Average:									50.8

* Values represent %. ** Reverse comparison taken from above factor tables.

In Table 4, for the fourth factor, health, the highest percentage is with environment and energy (74.1%). Following closely, with a small difference, is the comparison with technology, science, and digital society (69.9%). The transport factor comes next, with a percentage of 66.7%. The next factors, with a small difference between them, are high-tech

industry (65.6%) and education (64.5%). At the bottom of the list is the innovation factor (62.5%). Reverse comparisons with the economy, labor market, and poverty and social exclusion factors have percentages of 28%, 25.9%, and 19.4%, respectively.

Table 4. Expert evaluation of the impact of the health factor on regional competitiveness.

Factor 4: Health									
How Important Is the Factor of Health Compared to:	Not at All	Much Too Little	Barely Too Little	Columns Sum (Negative)	Equal Value	Very	Very Much	Absolutely	Columns Sum (Positive)
Education:	6.5 *	12.9	5.4	24.8	10.8	53.8	7.5	3.2	64.5
Environment and Energy:	5.4	9.7	5.4	20.5	5.4	59.1	7.5	7.5	74.1
Transport:	5.4	11.8	6.5	23.7	9.7	51.6	10.8	4.3	66.7
Technology, Science, and Digital Society:	9.7	8.6	7.5	25.8	4.3	52.7	8.6	8.6	69.9
High-tech Industry:	6.5	14	8.6	29.1	5.4	57	4.3	4.3	65.6
Innovation:	4.3	14	9.7	28	9.7	53.8	6.5	2.2	62.5
** Economy:									28.0
** Labor Market:									25.9
** Poverty and Social Exclusion:									19.4
Average:									52.9

* Values represent %. ** Reverse comparison taken from above factor tables.

In Table 5, for the fifth factor, education, the highest percentage is with transport (60.6%). Following closely, with a small difference, is the comparison with technology, science, and digital society (60.1%). The high-tech factor comes next, with a percentage of 58.8%. The next factors, with a small difference between them, at the bottom of the list, are innovation (55.7%) and environment and energy (54.5%). In this case, the reverse comparisons and their percentages are, economy with 17.2%, labor market with 21.5%, poverty and social exclusion with 23.7%, and health with 24.8%.

Table 5. Expert evaluation of the impact of the education factor on regional competitiveness.

Factor 5: Education									
How Important Is the Factor of Education Compared to:	Not at All	Much Too Little	Barely Too Little	Columns Sum (Negative)	Equal Value	Very	Very Much	Absolutely	Columns Sum (Positive)
Environment and Energy:	11.5 *	10.8	8.5	30.8	14.7	44.8	5.4	4.3	54.5
Transport:	7.5	6.5	8.6	22.6	16.8	48.8	4.3	7.5	60.6
Technology, Science, and Digital Society:	5.4	15.9	8.2	29.5	10.4	50.4	6.5	3.2	60.1
High-tech Industry:	4.3	14.6	11.5	30.4	10.8	44.8	9.7	4.3	58.8
Innovation:	10.5	17.2	7.3	35.0	9.3	43.9	4.3	7.5	55.7
** Economy:									17.2
** Labor Market:									21.5
** Poverty and Social Exclusion:									23.7
** Health:									24.8
Average:									41.9

* Values represent %. ** Reverse comparison taken from above factor tables.

The statistical analysis, which employed the one-way ANOVA (non-parametric) and Kruskal–Wallis tests [47], delved into the intricate relationships among the various factors at the regional level (see Table S3). Comparison between the economy and the labor market revealed a trend towards significance ($\chi^2 = 2.77521$, p = 0.096), suggesting a potential but inconclusive difference in their regional importance.

Similarly, the comparison between the economy and education showed a notable trend towards significance ($\chi^2 = 1.76868$, p = 0.184), prompting further investigation into their intertwined dynamics.

However, no statistically significant differences were observed in comparisons with other factors, such as poverty levels/social exclusion, health, or transportation.

Across regions, consistent perceptions were noted in various comparisons, indicating that factors like the labor market, poverty levels/social exclusion, health, and education may not significantly influence each other at the regional level. Some comparisons hinted at potential relationships, such as health versus innovation ($\chi^2 = 3.71413$, p = 0.054), but did not reach statistical significance.

Overall, while certain pairwise comparisons showed trends or potential influences, the majority did not indicate statistically significant differences, highlighting the complexity of factors influencing regional dynamics and the need for comprehensive analyses to grasp their full implications.

Continuing the analysis in Table 6, regarding the sixth factor of environment and energy, the highest percentage is with the innovation factor (68.8%). Following closely, with a small difference, is the comparison with high-tech industry (68.4%). The technology, science, and digital society factor comes next, with a percentage of 64.5%. At the bottom of the list, is the transport factor (14.0%). The reverse comparisons and their percentages are, economy with 20.5%, labor market with 22.8%, poverty and social exclusion with 20.4%, health with 20.5%, and education with 30.8%.

Table 6. Expert evaluation of the impact of factors in the environment and energy factor on regional competitiveness.

Factor 6: Environment and Energy									
How Important Is the Factor of Environment and Energy Compared to:	Not at All	Much Too Little	Barely Too Little	Columns Sum (Negative)	Equal Value	Very	Very Much	Absolutely	Columns Sum (Positive)
Transport:	8.6 *	14	6.5	29.1	57	4.3	6.5	3.2	14.0
Technology, Science, and Digital Society:	6.5	18.3	4.3	29.1	6.5	55.9	5.4	3.2	64.5
High-tech Industry:	3.3	7.6	10.9	21.8	9.8	54.3	8.7	5.4	68.4
Innovation:	4.3	12.9	3.2	20.4	11.8	53.8	9.7	5.3	68.8
** Economy:									20.5
** Labor Market:									22.8
** Poverty and Social Exclusion:									20.4
** Health:									20.5
** Education:									30.8
Average:									36.7

* Values represent %. ** Reverse comparison taken from above factor tables.

In Table 7, for the seventh factor of transport, the highest percentage is with the hightech industry factor (61.8%). The innovation factor comes next, with a percentage of 58.0%. At the bottom of the list is the technology, science, and digital society factor (49.6%). The reverse comparisons and their percentages are economy with 29%, labor market with 21.5%, poverty and social exclusion with 25.8%, health with 23.7%, education with 22.6%, and environment and energy with 29.1%.

In Table 8, regarding the eighth factor of technology, science, and digital society, the highest percentage is with the innovation factor (56.6%). Next, and at the bottom of the comparisons, is the high-tech industry factor (54.4%). The reverse comparisons and their percentages are: economy with 17.2%, labor market with 30.1%, poverty and social exclusion with 73.1%, health with 25.8%, education with 29.5%, environment and energy with 29.1%, and transport with 36.7%.

Factor 7: Transport									
How Important Is the Factor of Transport Compared to:	Not at All	Much Too Little	Barely Too Little	Columns Sum (Negative)	Equal Value	Very	Very Much	Absolutely	Columns Sum (Positive)
Technology, Science, and Digital Society:	11.5 *	11.5	13.7	36.7	13.7	40.9	5.4	3.3	49.6
High-tech Industry:	5.3	14.7	8.5	28.5	9.7	45.7	11.8	4.3	61.8
Innovation:	6.5	12.5	8.3	27.3	14.7	40.8	7.5	9.7	58.0
** Economy:									29.0
** Labor Market:									21.5
** Poverty and Social Exclusion:									25.8
** Health:									23.7
** Education:									22.6
** Environment and Energy:									29.1
Average:									35.7

Table 7. Expert evaluation of the impact of factors in the transport factor on regional competitiveness.

* Values represent %. ** Reverse comparison taken from above factor tables.

Table 8. Expert evaluation of the impact of factors in the technology, science, and digital society factor on regional competitiveness.

Factor 8: Technology, Science, and Digital Society									
How Important Is the Factor of Technology Science and Digital Society in Compared to:	Not at All	Much Too Little	Barely Too Little	Columns Sum (Negative)	Equal Value	Very	Very Much	Absolutely	Columns Sum (Positive)
High-tech Industry:	11.8 *	10.8	12.6	35.2	10.4	45.8	4.3	4.3	54.4
Innovation:	8.3	16.1	7.5	31.9	11.5	50.1	4.3	2.2	56.6
** Economy:									17.2
** Labor Market:									30.1
** Poverty and Social Exclusion:									73.1
** Health:									25.8
** Education:									29.5
** Environment and Energy:									29.1
** Transport:									36.7
Average:									39.2

* Values represent %. ** Reverse comparison taken from above factor tables.

In Table 9, for the ninth factor of high-tech industry, the comparison with the innovation factor has a percentage of 53.5%. The reverse comparisons and their percentages are: economy with 29.1%, labor market with 32.2%, poverty and social exclusion with 32.3%, health with 29.1%, education with 30.4%, environment and energy with 21.8%, transport with 28.5%, and technology, science, and digital society with 35.2%.

In Table 10, for the innovation factor, the metrics here consist of the sum of the reverse comparisons of innovation with the rest of the indicators.

The statistical analysis explores the intricate relationships among the environment and energy, transportation, technology and digital society, high-Tech industry, and innovation.

Comparison of environment and energy versus transportation revealed no significant impact ($\chi^2 = 0.58832$, p = 0.443), indicating a lack of association between these factors at the regional level. However, other interactions unveil noteworthy insights. The negligible impact of environment and energy on technology and digital society dynamics ($\chi^2 = 0.00318$, p = 0.955) underscores consistent regional perceptions of their insignificance in this realm.

Table 9. Expert evaluation of the impact of factors in the high-tech industry factor on regional competitiveness.

Factor 9: High-Tech Industry									
How Important Is the Factor of High-Tech Industry in Compared to:	Not at All	Much Too Little	Barely Too Little	Columns Sum (Negative)	Equal Value	Very	Very Much	Absolutely	Columns Sum (Positive)
Innovation:	10.8 *	15.6	8.6	35.0	11.5	48.1	3.2	2.2	53.5
** Economy:									29.1
** Labor Market:									32.2
** Poverty and Social Exclusion:									32.3
** Health:									29.1
** Education:									30.4
** Environment and Energy:									21.8
** Transport:									28.5
** Technology, Science, and Digital Society:									35.2
Average:									32.5

* Values represent %. ** Reverse comparison taken from above factor tables.

Table 10. Expert evaluation of the impact of factors in the innovation factor on regional competitiveness.

Factor 10: Innovation								
How Important Is the Factor of the Innovation in Compared to:								
** Economy:	22.7 *							
** Labor Market:	25.9							
** Poverty and Social Exclusion:	28.0							
** Health:	28.0							
** Education:	35.0							
** Environment and Energy:	20.4							
** Transport:	27.3							
** Technology, Science, and Digital Society:	31.9							
** High-tech Industry:	35.0							
Average:	28.2							

* Values represent %, ** Reverse comparison taken from above factor tables.

Although transportation's influence on innovation falls slightly above the conventional threshold ($\chi^2 = 3.15714$, p = 0.076), suggesting a potential relationship, it remains statistically insignificant. Across other comparisons, such as environment and energy versus high-tech industry ($\chi^2 = 0.09027$, p = 0.764) and technology and digital society versus high-tech industry ($\chi^2 = 1.30113$, p = 0.254), consistent perceptions emerge without statistical significance.

Overall, while some interactions hint at significance, the majority underscore consistent regional perceptions across these domains, highlighting the complexity of their interplays and the need for further exploration. Upon comprehensive analysis of the statistical data regarding the perceptions of various factors influencing regional development, several significant conclusions come to light. Firstly, the findings reveal a nuanced interplay between different factors and regional development outcomes. While factors such as the economy demonstrate a discernible impact on employment and poverty levels, other factors like health and transportation or health and high-tech industry exhibit less pronounced associations.

These results underscore the intricate and multifaceted nature of regional development dynamics, suggesting that regional development outcomes are shaped by a complex interplay of economic, social, and environmental factors. Furthermore, the lack of significant associations in some cases highlights the need for tailored and context-specific policy interventions that account for the unique characteristics and challenges of each region. In essence, this analysis emphasizes the importance of adopting a holistic approach to regional development planning, one that considers the diverse array of factors at play and seeks to address the multifaceted needs of communities to foster sustainable and inclusive development across regions.

4. Discussion

The results presented above indicate that experts agree with the findings in the literature regarding the order of priority and the interrelations of the ten factors in measuring regional competitiveness. The complexity of regional competitiveness dynamics varies significantly between developed and less developed regions. Addressing these differences is crucial for tailoring effective policies and strategies that foster sustainable development and enhance competitiveness across diverse regional contexts.

The economy shows an increased pursuit of economic stability and sustainability (average of 69.1% based on the nine questions included in the questionnaire). Regional economies are increasingly interested in investing in sectors that promote sustainable development and technological innovation [49,50]. Our results agree with other reports indicating that there is a growing effort to create innovative solutions that will increase productivity and improve the efficiency of regional economies [51].

The labor market provided an average of 64.7% (based on the eight questions included in the questionnaire). The results show that regions reflect a quest to create economic stability and social well-being, which agrees with the literature analysis [52]. With a significant contribution from the labor market, regions can attract investment and create conditions that promote growth and competitiveness. Furthermore, improving access to work and increasing job opportunities encourages labor mobility and helps create a workforce that is more adaptable and competitive in the global marketplace [53].

Poverty levels and social exclusion reduction (average of 50.9% from seven questions included in the questionnaires) are priorities for regions seeking growth and sustainability [54]. In the literature analysis and in our results, we can see that by developing programs and policies aimed at social cohesion and promoting equal opportunities, regions create a fairer environment conducive to the development of each individual and community [55].

Attention to health (average of 52.9% from six questions included in the questionnaires) is emerging as a critical factor for regional competitiveness. Our results are based on how regional communities invest in health infrastructure and services that promote disease prevention and improve the quality of life of their residents [56]. Indeed, the literature suggests that promoting healthy living and creating healthy environmental conditions can help reduce healthcare costs and increase workforce productivity [57].

Education (with an average of 41.9% from five questions included in the questionnaires) reflects the commitment of the regions to developing human capital and promoting knowledge and skills. By providing access to quality education and training, regions create a workforce that is more adaptable and competitive in the global marketplace [58]. In this way, the literature analysis and our findings show that education promotes innovation, creativity, and the development of new ideas and technological solutions that enhance the competitiveness of regions globally [59].

Environmental and energy resources (with an average of 36.7% from four questions included in the questionnaires) is a critical factor for regional competitiveness. In the literature, we found that regional communities invest in green technologies and sustainable practices that reduce greenhouse gas emissions and resource consumption [60]. Indeed, our expert-derived results show that regions strive to create a sustainable environment conducive to the development and well-being of their inhabitants, thereby enhancing their competitiveness globally [61].

In the transport factor (with average of 35.7% from three questions included in the questionnaires), the literature analysis give attention to regional communities that invest in infrastructure and transport services that improve access and mobility for their residents and businesses [62]. Our expert-derived results show that by improving public transport,

road networks, and freight infrastructure, regional communities create a more unified and efficient environment for transporting people and goods [63].

Technological science and digital society (with an average of 39.2% from two questions included in the questionnaire) is where regional communities invest in digital infrastructure and technological innovations that boost productivity and innovation in all sectors of the economy [64]. Literature analysis shows that by creating an environment that fosters the development and application of new technologies, regional communities can create a more innovative and competitive environment that promotes the development and well-being of their residents [65].

The development of high-tech industries (with an average of 32.5% from one question included in the questionnaires) helps regional communities invest in research centers, technology parks, and innovative businesses specializing in high-quality products and services [66]. Our findings show that by promoting research and development in areas such as biotechnology, IT, and telecommunications, regional communities can create a favorable environment for the development of new technological products and the creation of high added value, which agrees with the literature analysis [67].

Regarding innovation (with an average of 28.2%), the literature analysis agrees with our results from our experts and shows that regional communities invest in education and research programs that promote creativity and innovation in all sectors of the economy [68,69]. By creating an environment that encourages the development and implementation of new ideas and technologies, regional communities can create a more dynamic and competitive economic environment [70].

The integration of sustainability aspects into these key determinants highlights the need for adaptable approaches that accommodate regional disparities in resources and developmental stages. Based on the above discussion, we can see that the development of a dynamic economy, underpinned by diverse sectoral activities and innovative business initiatives, is a foundation for job creation and income growth. Investing in the education and health of the population enhances human capital and productivity, creating a healthy and competitive workforce [71]. Factors such as economic resilience, technological advancement, and environmental sustainability are emerging as key drivers shaping decisions in this evolving landscape [72]. Developing resilient regional economies and sustainable practices fosters a sense of security and collective well-being among individuals and communities [73]. The whole meaning of "Regional Development" is defined by all the above factors, with strong dependance between them.

5. Conclusions

This study contributes to the understanding of regional competitiveness by elucidating the diverse roles of ten key factors across different stages of development. The findings underscore the importance of tailored approaches that consider regional contexts and challenges. By integrating sustainability principles into policy frameworks, regions can enhance their resilience and competitiveness in a globalized economy.

Our research delves into the intricate dynamics of regional competitiveness, emphasizing the indispensable role of expert insights in understanding these complexities. Through the analysis of expert opinions in combination with surveys and comprehensive reviews from the existing literature, we discern the multifaceted interplay of various factors shaping regional success.

Our findings highlight the foundational significance of the economy, the labor market, and the health infrastructure, marking them as primary determinants of regional performance. However, we also uncover a range of factors contributing to regional growth.

The study reveals that education emerges as a critical component for nurturing human capital, promoting well-being, and enhancing productivity. Environmental sustainability emerges as a pivotal concern, with the health of ecosystems directly impacting regional resilience. Equally crucial is addressing youth employment, which ensures both economic vitality and social stability within regions. Furthermore, our research elucidates the catalytic role of collaboration and strategic investment in bolstering regional competitiveness. Strategic investments in infrastructure, such as transportation networks and educational facilities, are essential for laying the groundwork for sustained growth and prosperity.

However, it is essential to acknowledge the inherent limitations of our research. We must remain aware of potential biases in expert perspectives and the subjectivity in data collection processes. Moreover, the dynamic nature of regional dynamics requires ongoing monitoring and evaluation to ensure the continued relevance and validity of our findings. Additionally, our study may be constrained by factors such as data availability, sample size, and the specific contexts within which our research was conducted.

The novelty of this study lies in its multifactorial analysis and the comprehensive approach to understanding regional competitiveness through expert insights. This study contributes to improving the results of previous research by providing a holistic and multifactorial perspective on regional competitiveness, highlighting the interconnectedness of key factors and their collective impact on regional development. Future research could delve deeper into specific regional contexts, incorporate longitudinal data analysis, and explore emerging trends to enhance our understanding further. Our analysis warrants more scrutiny in the future, employing multicriteria methods to validate our findings.

By embracing a holistic perspective and fostering a culture of continuous inquiry, we can navigate the complexities of regional development and pave the way towards a more prosperous and sustainable future.

Supplementary Materials: The following supporting information can be downloaded at: https://www. mdpi.com/article/10.3390/su16145944/s1, Table S1: Questionnaire of the ten key factors by experts for regional competitiveness, Table S2: Descriptives of the questionnaires for regional competitiveness, Table S3: One-way ANOVA (non-parametric)—Kruskal–Wallis test values.

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