

Assessing the Competitiveness of the Tourism Industry in Czechia

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Abstract

Czechia's tourism industry plays a key role in the country's economy, contributing to economic growth and improving the population's welfare. This study aims to develop a model for assessing the competitiveness of the Czechia tourism industry. The study applies mathematical, economic, statistical, factor, expert, and sensitivity analyses, as well as abstract and logical methods. Key trends in the tourism sector were analysed, leading to the creation of a matrix that maps favourable geographical conditions for tourism development in Czechia. Findings show that Czechia is advancing through science and technology and has strong tourism potential. The competitiveness of its tourism industry is influenced by the country's research and development capacity, scientific and technological progress, and its ability to attract both domestic and foreign investment. The originality of this study lies in the proposed model for assessing tourism competitiveness using an integral indicator that reflects coordination between tourism market players and the broader tourism system. The study also outlines ways to strengthen the industry's competitiveness. Using the integral indicator as a tool for attracting investment can promote rapid and sustainable growth in both domestic and international tourism markets while supporting alignment with global standards. Special attention is given to the role of geological heritage and Earth resource sites as drivers of regional tourism, highlighting their contribution to sustainable destination development and public engagement with natural sciences. Geotourism is considered as an important area of development, combining the preservation of geological heritage with the popularization of Natural Sciences and the steady growth of the tourism industry in the Czechia.

Keywords

competitiveness, assessment, tourism industry, geotourism, Czechia



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Introduction

The Czechia tourism sector is currently at a crossroads of global transformations that will shape its future competitiveness. Geopolitical tensions, macroeconomic challenges and shifts in consumer behaviour are creating new conditions for the development of tourism services. At the same time, technological advancements, environmental trends, and strategic market diversification are driving the industry to adapt and innovate. Geotourism, as an emerging trend, offers new opportunities for sustainable tourism development by leveraging the country's unique geological heritage.

To assess the competitiveness of the tourism industry, it is essential to conduct a detailed analysis of the factors influencing its dynamics and to develop an assessment model that can identify current challenges and predict potential development paths. A key part of this analysis is distinguishing between the general competitive advantages of Czechia and the specific features of its tourism sector. These sector-specific characteristics have been identified in our previous research and form the basis for further study in this area (Burda et al., 2023; But, 2024a; 2024b; But et al., 2023).

There are various approaches to evaluating and enhancing the competitiveness of the tourism industry. Goncarova et al. (2020) emphasize the impact of customer satisfaction on the competitiveness of family tourism. Law et al. (2023) examine the use of soft power to enhance national reputation and airline competitiveness in Asia and Oceania. Leon et al. (2022) analyze the competitiveness of tourism destinations in Central America and the Caribbean. Luo et al. (2022) explore strategies for improving the competitiveness of tourism industrial parks within the context of new urbanization. Moreno-Izquierdo et al. (2018) studied long-term tourism competitiveness in the age of innovation. Purwono et al. (2024) discovered tourism destination performance and competitiveness. Phuthong et al. (2023) propose an innovative mobile application for assessing wellness tourism competitiveness. Psogogiorgos et al. (2015) compare Porter's and Krugman's approaches to regional competitiveness. Ragimkhanov and Zhukovskaya (2023) assess current challenges in the competitiveness of tourism services across regions. Vlach et al. (2025) focus on the financial dynamics and strategic growth, while Strouhal et al. (2024) use difference-in-difference analysis, and Vašaničová et al. (2023) used a quantile regression model. Poliaková et al. (2024) focused on the interconnections between CSR, financial management, and sustainability in the service sector. Romão and Nijkamp (2019) analyze the effects of innovation, productivity, and specialization on tourism competitiveness in European regions. Sanchez-Rivero and Rodriguez-Rangel (2022) conduct competitive benchmarking of tourism resources and products in Spain. Sarancha (2020) evaluates the tourism competitiveness of the Baltic states. The studies by Vasquez et al. (2021a, 2021b) and Cronjé et al. (2020) highlight key factors such as infrastructure, regulatory frameworks, and innovation, offering valuable insights for policymakers and stakeholders seeking to strengthen tourism competitiveness. Khalifa et al. (2023) created a mediated-moderated model to study innovation mechanism in the hospitality industry. Collectively, these studies provide a solid foundation for developing a model to assess the competitiveness of the tourism industry in Czechia, taking into account elements such as customer satisfaction, innovation, resource management, and the strategic use of soft power.

One critical issue is the imbalance in the regional distribution of tourist flows (Burda et al., 2023). Prague dominates as the primary tourist center (CSO, 2024b), while peripheral regions remain insufficiently integrated into Czechia's overall tourism model. A comprehensive analysis of regional competitive advantages and strategic planning for their development is necessary. Another important challenge is the structural instability of the industry. Although overall tourist numbers are increasing, uneven customer demand and the varying economic capacity of tourism enterprises affect the balance between supply and demand (Tsviliy et al., 2024). A study by But et al. (2023) highlights the need for strategies to attract more affluent tourists, especially from the US and Asia. This requires improvements in air logistics, a reassessment of marketing investments, and upgrades in premium service quality. In addition, the environmental aspect of tourism competitiveness requires further attention. Research by Tothová et al. (2022) shows that environmental strategies can generate long-term benefits, though their impact during crises remains limited. Meanwhile, Gudž et al. (2023) emphasize that sustainable tourism is gaining popularity globally, creating an opportunity for Czechia to attract environmentally conscious tourists.

While existing studies (But, 2024b; Zhang et al., 2023) examine certain aspects of competitiveness, they lack a comprehensive model that integrates macroeconomic, resource, and technological factors. As such, this paper aims to develop a comprehensive model for assessing the competitiveness of the Czechia tourism industry. The model seeks to identify key drivers of development, highlight existing weaknesses, and provide recommendations for improving the industry's integration into the global tourism space. In addition to traditional tourism assets, Czechia has the potential to develop thematic tourism based on its rich legacy in geology and geological survey, mining, and Earth resources, which can attract visitors interested in industrial heritage and natural sciences. Geotourism, in particular, can play a significant role in diversifying tourism offerings and promoting sustainable regional development (Li et al., 2024); (Iannaccone, et al., 2025). Moreover, the integration of sites related to underground engineering, mining transport, and ecotechnology into regional

tourism strategies may enhance diversification and promote sustainable development in post-industrial areas. The central objectives of this study are to identify key economic indicators, analyse the impact of external and regional factors influencing tourism dynamics in Czechia, and propose strategies for global integration.

The proposed model draws on internationally recognized competitiveness frameworks widely used in tourism research, including Porter's Diamond Model (Porter, 1998), Ritchie and Crouch's Destination Competitiveness Model (Ritchie & Crouch, 1999), and Dwyer and Kim's Integrated Model (Dwyer & Kim, 2003). Porter argues that regions compete not through cheap labour or raw materials, but through the efficiency of regional clusters that foster a favourable business environment. The Ritchie and Crouch model highlights the influence of both internal and external factors on a destination's competitiveness, supporting conditions for sustainable tourism that benefits local communities. The Dwyer and Kim model allows for the evaluation and ranking of competitiveness factors and is often used to compare tourism destinations. These models are widely applied in academic research and strategic tourism planning. While they offer interdisciplinary depth and a systemic view of destination development, they also contain analytical elements that are largely descriptive or subjective.

This study addresses current challenges and proposes solutions through systematic economic analysis and the development of a strategic model to help the Czechia tourism sector adapt to modern global conditions.

Literature Review

The proposed model draws on internationally recognized competitiveness frameworks widely used in tourism research, including Porter's Diamond Model (Porter, 1998), Ritchie and Crouch's Destination Competitiveness Model (Ritchie & Crouch, 1999), and Dwyer and Kim's Integrated Model (Dwyer & Kim, 2003). Porter argues that regions compete not through cheap labour or raw materials, but through the efficiency of regional clusters that foster a favourable business environment. The Ritchie and Crouch model highlights the influence of both internal and external factors on a destination's competitiveness, supporting conditions for sustainable tourism that benefits local communities. The Dwyer and Kim model allows for the evaluation and ranking of competitiveness factors and is often used to compare tourism destinations. These models are widely applied in academic research and strategic tourism planning. While they offer interdisciplinary depth and a systemic view of destination development, they also contain analytical elements that are largely descriptive or subjective.

This study addresses current challenges and proposes solutions through systematic economic analysis and the development of a strategic model to help the Czechia tourism sector adapt to modern global conditions.

To understand the competitiveness of the tourism industry, a comprehensive approach is required—one that considers economic, social, and technological factors. A review of the scientific literature reveals a range of methods for assessing competitiveness, from institutional models of European integration (Prychepa et al., 2022) to technological and business analytical tools (Nyanga et al., 2020). Much of the research focuses on the structural determinants of the tourism sector, such as the availability of tourism resources (Grassini et al., 2023) and the impact of external market factors (Kapustina et al., 2017). Findings confirm that the competitiveness of the tourism industry is shaped by a combination of resource availability, infrastructure quality, and the effectiveness of strategic management. Particular attention should be given to the SERVQUAL method (Constandache et al., 2011), which assesses tourist satisfaction—a key indicator of perceived competitiveness.

In the context of Czechia, But (2024b) highlights the application of Porter's Five Forces of Competition model for strategic mapping of the regional tourism industry. This approach helps identify key problem areas and develop effective solutions. An analysis of the impact of global and national trends on tourism, especially the use of digital technologies, shows how competitiveness can improve through introducing digital tools, addressing digitalization challenges, and enhancing tourism services (But, 2024a; But et al., 2023). At the same time, Prokeš (2013) demonstrates the potential of the cluster approach to strengthen regional tourism offerings. A comparative analysis of the competitiveness of Czechia and Slovakia emphasizes the importance of investment flows in developing tourism services (Bucher et al., 2016). Phaosathianphan and Leelasantitham (2022) developed a conceptual model for assessing tourism industry competitiveness based on four key aspects: the traveler life cycle, VPD success, VPD continuation, and travel and tourism. This model stresses the need to introduce smart travel technologies that deliver a seamless consumer experience. Tleuberdinova et al. (2022) assessed tourism industry competitiveness using quantitative and qualitative methods. Their study ranked competitiveness indicators collected from business owners and managers in the tourism sector. The resulting weighted assessment helps researchers and policymakers understand macro- and microeconomic factors affecting the quality and competitiveness of tourism services.

Zhang et al. (2023) and Fernández et al. (2020) developed an assessment system for integrated competitiveness that considers resources, economic factors, and environmental aspects. This method allows regions (using China as an example) to be classified by type of economic development and helps identify effective ways to improve competitiveness. Chiriko et al. (2021) studied the competitiveness of the tourism

industry from the perspective of tour operators. They found that the main factors influencing the quality of tourism services were destination resources, infrastructure, ancillary services, and personnel. Tothova et al. (2022) examined the relationship between active environmental strategies in tourism and industry competitiveness. They noted that during times of crisis, the environmental friendliness of tourism services does not affect their attractiveness; however, environmental strategies can create long-term competitive advantages.

Given these results, this paper proposes an integrative approach to evaluating the competitiveness of the Czechia tourism industry. The assessment's structural model should include the following components:

- i. Macroeconomic factors, particularly investment levels, regulatory conditions, and the competitive environment (Kapustina et al., 2017).
- ii. Resource potential, including natural, cultural, and infrastructural components (Grassini et al., 2023; But, 2024b).
- iii. Technological and business analytical solutions that support the tourism sector's adaptation to emerging challenges (Nyanga et al., 2020; Phaosathianphan and Leelasantham, 2022).
- iv. Assessment of tourism service quality based on customer satisfaction and management initiatives (Constandache et al., 2011).
- v. Environmental aspects that ensure the long-term sustainability of the industry (Tothova et al., 2022).
- vi. Financial competitiveness and investment activity (Bucher et al., 2016).

This synthesized research approach enables the development of a comprehensive model for assessing the competitiveness of Czechia's tourism industry. The model combines both quantitative and qualitative analytical methods and accounts for the regional and international dynamics of tourism market development.

Material and Methods

The aim of this study is to develop a model for assessing the competitiveness of the tourism industry in Czechia.

The study used the following research methods:

- i. Mathematical and economic methods to develop a methodology for calculating the integral indicator used in assessing competitiveness.
- ii. Abstract and logical methods for theoretical generalizations and drawing conclusions.
- iii. Statistical methods to analyse the impact of scientific and technical technologies on European and global markets.
- iv. Factor analysis to reduce subjectivity in assigning weights and ensure a more objective assessment.
- v. Sensitivity analysis and expert evaluation, involving the collection of primary data and the processing of secondary data sourced from JSTOR, EconLit, ScienceDirect, Google Scholar, and the World Wide Web.

The research was supported by the following information databases: Travel and Tourism Development Index (TTDI), International Institute for Management Development (IMD), The Sustainable Competitiveness Report (GSC), UNTourism, Czech Statistical Office, Statista, National Tourism Export Strategies, World Travel and Tourism Council (WTTC), and the Ministry of Regional Development of Czechia.

The study involved 25 experts from the tourism industry, economics, and public administration, each with over 10 years of professional experience. The experts represent the following institutions: Ministry of Regional Development of Czechia (10 people, 10 years of experience), Academic research centres: Charles University (5 persons, 20 years of experience), Academy of Sciences of the Czechia (10 persons, 7-10 years of experience).

The competitiveness of Czechia's tourism industry was assessed using statistical data from Prague and the country's 13 regions. The study focused on the most recent data available, covering the period from 2022 to 2023.

Factor analysis was applied to enhance the accuracy and reliability of the weight assignment for competitiveness indicators. Since expert-based weight assignment is often subjective, factor analysis was used to uncover latent relationships among variables and assign weights based on empirical correlations. This approach improved the validity of the integral indicator and provided a solid foundation for sensitivity analysis, which demonstrated how changes in individual weights influence the final score.

The study used a methodological approach to assess the competitiveness of the tourism industry in Czechia, based on an integral indicator. This indicator is developed through the analysis of two key components: the country's sustainable competitiveness, P_k and the systemic and comprehensive prerequisites for tourism industry development, P_n .

Using Eq. (1), the integral indicator of tourism industry competitiveness in Czechia is determined as follows:

$$P_s = \sqrt{P_k * P_n} \quad (1)$$

where:

P_s – the integral indicator of the tourism industry's competitiveness in Czechia;

P_k – the indicator of the country's sustainable competitiveness;

P_n – the indicator of the systemic and complex preconditions for the tourism industry's development in Czechia.

The indicator for the country's sustainable competitiveness, P_k in Eq. (1) is determined using Eq. (2) as follows:

$$P_k = \sum P_i * W_i \quad (2)$$

where:

P_i – expert assessment of the use of the i-th element of the country's sustainable competitiveness indicator, measured in points (natural capital, resource efficiency, social capital, intellectual capital, economic sustainability, and public administration efficiency).

W_i – weighting coefficient of the i-th indicator of the country's sustainable competitiveness (natural capital, resource efficiency, social capital, intellectual capital, economic sustainability, and public administration efficiency).

The indicator of systemic and complex prerequisites for the development of the tourism industry, P_n in Czechia is determined using Eq. (3) below.

$$P_n = \sum P_i * W_i \quad (3)$$

where:

P_i – Expert assessment of the i-th element of the indicator for systemic and complex prerequisites in the development of the Czech tourism industry (including attraction of domestic and foreign investment, scientific and technical capabilities, forecasting consumer purchasing power, use of international experience in tourism management, the role of the non-governmental sector, and the development of European integration processes),

W_i – weighting coefficient of the i-th indicator.

The experts assessed the level of the integral indicator of competitiveness of the Czechia tourism industry on the following scale:

from 0 to 5.5 - low level,

from 5.5 to 8.0 - medium level,

from 8.1 to 12.0 - high level.

The integral indicator of Czechia's tourism industry competitiveness allows assessment of the industry's development prospects. Figure 1 shows a graphical diagram of the proposed model.

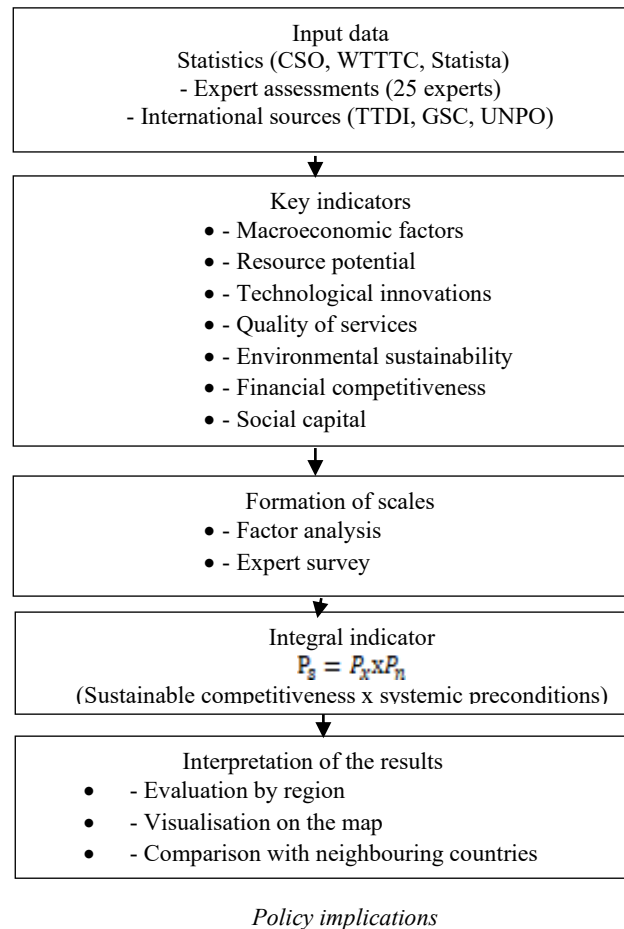


Fig. 1. Conceptual diagram of the model for assessing the competitiveness of the Czechia tourism industry [developed by the authors]

Results

The main tourism industry development trends in Czechia

Trends in Czechia's tourism industry can be seen through the number of guests accommodated, their motivations, and tourism types. The number of guests in the second quarter of 2024 shows a significant increase compared to 2023. This growth was supported by efforts to boost the country's tourism potential, including hosting the World Ice Hockey Championship in Prague and the South Moravian Region in May 2024, which attracted many international sports fans.

In May 2024, the number of non-residents in Prague rose by 9.2% compared to 2023. Most foreign tourists came from participating countries, with visitors from Finland (48.8%), Switzerland (43.5%), and Canada (39.4%) leading the increase. On average, Finns stayed three nights in Prague, Canadians 2.7 nights, and Swiss visitors 2.5 nights (CSO, 2024a).

The number of non-residents in the Moravian-Silesian region increased by 25.7% compared to 2023. The biggest growth came from Sweden (150.4%) and Kazakhstan (127.9%), while visitors from Latvia, Finland, and Slovakia also rose by over 50%. Guests from Canada (3.8 nights), Sweden (3.6 nights), France, and the United States (2.9 nights each) stayed the longest in the Moravian-Silesian region. Visitors from neighboring countries stayed shorter periods: 2.0 nights from Poland and 1.9 nights from Slovakia (CSO, 2024).

Currently, inbound, outbound, and domestic tourism are developing in Czechia. Domestic tourism, involving residents and migrants visiting within the country, has grown despite challenges like the Covid-19 pandemic, the Russia-Ukraine war, and a decline in Russian tourists.

Organized tourism is growing, but individual tourism is gaining momentum thanks to online services and artificial intelligence. The "Euro weekend" concept, focused on short weekend trips, is popular among Germans, Slovaks, Poles, and other neighbors.

In Czechia, educational tourism, sightseeing, business tourism, health and wellness tourism, and medical tourism are widespread. Many visitors come for medical reasons and explore tourist sites during their stay. Despite heavy beer consumption, Czechs are very sporty, making sports tourism popular nationwide.

Market research shows the Czechia brand is less known than Prague. Prague attracts 50% of all tourists visiting the country (But et al., 2023). Main trends include growth in inbound, individual, and medical tourism. Prague, Karlovy Vary, Mariánské Lázně, and Františkovy Lázně—known as the UNESCO triangle—are especially popular.

Matrix of geographical positioning of favourable conditions for the tourism industry's development in Czechia

In the 21st century, the introduction of modern information technologies, including artificial intelligence (AI), plays a key role in the development of Czechia's tourism industry. AI supports progress at every stage of the tourism product lifecycle, from creation to consumption. However, for AI to have a beneficial impact, certain conditions must support technological development.

To examine the link between Czechia's tourism potential and its research and development (R&D) capacity, we use a matrix of geographical positioning of favourable conditions for global tourism development. The Travel & Tourism Development Index (TTDI), developed by the World Economic Forum (WEF) in 2021, ranks countries every two years. The TTDI methodology has been updated and now includes five sub-indices, 17 main components, and 112 indicators.

The index helps governments enhance national and international tourism competitiveness, attract more tourists, and support tourism growth. TTDI covers 117 countries and includes data related to tourism service provision.

When analysing competitiveness, it is useful to consider Porter's theory, as he was one of the first to highlight the importance of geographical location. According to Porter (2008), the closer companies are geographically, the higher their potential for innovation and export. This shows that the geographical concentration of tourism companies plays a crucial role in boosting their competitiveness.

The C rating scale is used to assess favourable conditions for tourism industry development in different regions. It is based on criteria such as economic development, infrastructure, political stability, and cultural and natural resources. Scores on the scale range from 1 to 3:

- 1 point: Low level of favourable conditions – regions with low economic development, poor infrastructure, and limited tourism resources.
- 2 points: Medium level of favourable conditions – regions with moderate economic development and infrastructure, with potential for tourism growth.
- 3 points: High level of favourable conditions – regions with strong economic development, well-developed infrastructure, and abundant tourism resources.

Czechia, located in Central Europe, has strong potential for tourism industry growth. This is supported by its high level of economic development and favourable tourism conditions, reflected in its high score on the Travel & Tourism Development Index (TTDI).

To evaluate Czechia's competitiveness in the global tourism market, it is crucial to analyse its reliance on research and development, scientific and technological progress, and investment. This analysis can be carried out using a matrix as shown in Fig 2. which shows the geographical distribution of favourable tourism development conditions.

According to the World Economic Forum and the World Travel & Tourism Council, the geographical concentration of countries with high tourism potential highlights the link between scientific and technological progress and economic development. TTDI indicators correlate with GDP, international tourist arrivals, and tourism-related income. This helps identify economies best positioned for recovery in trade and technology, as well as those needing greater investment in these areas (WTTC, 2023).

Low- and middle-income countries generally have lower TTDI scores, which can slow their economic recovery. Investing in science and technology accelerators can support these countries in boosting economic growth and tourism development. Regions in this category include North Africa, Eurasia, and North and Central America (bottom right corner in Fig. 2).

Countries with high TTDI scores typically have well-developed infrastructure and effective tourism strategies. They recover quickly from crises and support sustainable growth. These include Western Europe, the East Asia-Pacific region, and Northern Europe (upper left and right corners in Fig. 2).

Countries that depend on scientific and technological progress but have lower TTDI scores need to better utilize their potential. These include South America, South Asia, South Africa, West Africa, the Middle East, the Balkans, and parts of Eastern and Central Europe (bottom left corner in Fig. 2).

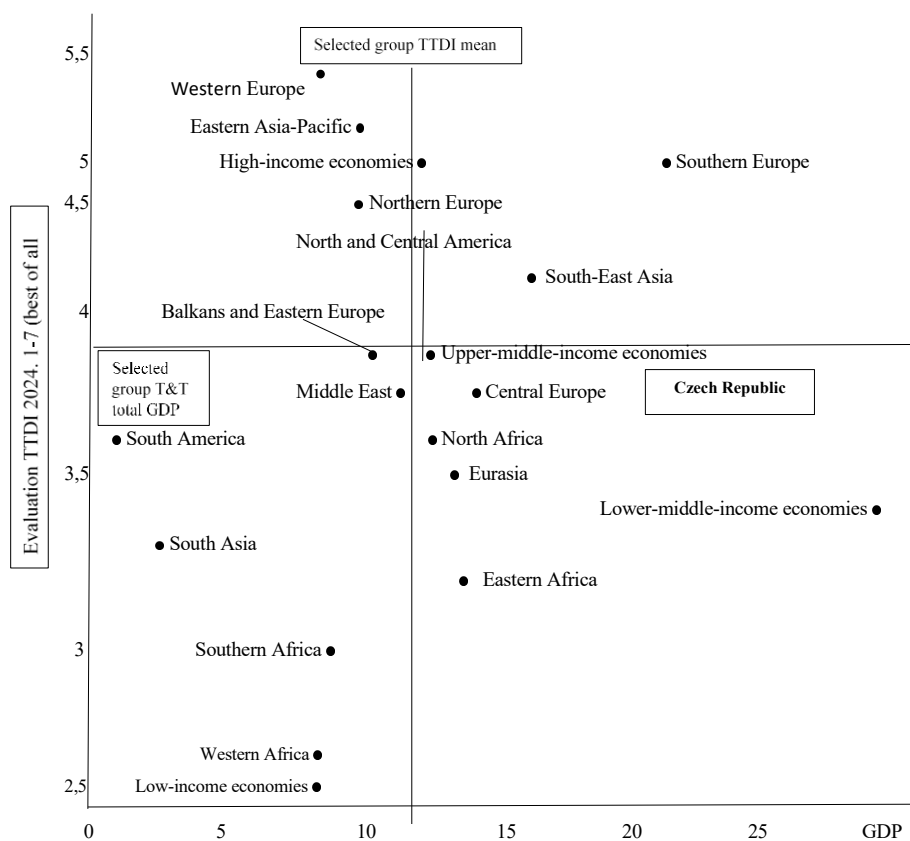


Fig. 2. Matrix of geographical location positioning for favourable conditions for world tourism development (based on the total contribution of tourism to GDP) (WTTC, 2023)

*Notes: Values on the index and GDP axes are based on the average for the 117 economies ranked in the TTDI 2021. Regional and income group values are also based on average scores. GDP data represent the average of direct, indirect, and induced outputs for the years 2018, 2019, and 2020.

As a country with high tourism potential, Czechia should stimulate economic growth by creating jobs and offering quality tourism services. This can be achieved through research and development, advancement in scientific and technical technologies, and attracting both domestic and foreign investment. These efforts will ensure long-term growth in the country's innovation potential and support other sectors of the economy. Czechia has all the prerequisites for further tourism industry development, as evidenced by its high scores on the Geographical Positioning of Favourable Conditions Matrix in Fig. 2.

Assessment of the tourism industry's competitiveness in Czechia

The competitiveness of Czechia's tourism industry was assessed using statistical data from Prague and the country's 13 regions, applying formulas 1, 2, and 3. The study covers the period from 2022 to 2023, based on the most recent data available for Czechia and the national economy. Data sources include the Global Sustainable Competitiveness Index (GSC Index), the Czech Statistical Office, the Ministry for Regional Development of Czechia, and expert assessments.

Indicator selection was guided by a review of scientific literature and the specific characteristics of the tourism industry. The main groups of indicators include: macroeconomic factors, resource potential, technological and business analytical solutions, quality of tourism services, environmental aspects, and financial competitiveness.

While some indicators may not seem directly related to tourism, they are important for assessing overall competitiveness. For example, agriculture reflects natural capital and resource sustainability. Access to healthcare affects social capital and influences a country's attractiveness to tourists. Inflation and employment rates reflect economic stability, which is essential for tourism development. Together, these indicators provide a comprehensive view of tourism competitiveness by accounting for both economic and social factors.

Table 1 presents the results of the components of Czechia's sustainable competitiveness indicator.

Tabl. 1. Components of Czechia sustainable competitiveness indicator

Ingredients	Parameters	Weight (1)	City Prague.	
			points (1-3)	A balanced assessment
1. General state of natural capital	1.1 State of agriculture		2	
	1.2 Biodiversity availability and status		3	
	1.3 State of water resources		3	
	1.4 Availability of energy and mineral resources		3	
	1.5 Water pollution, biodiversity, air pollution		2	
Final assessment		0.12	13	1.56
2 General state of resource efficiency	2.1. Availability of electricity, renewable energy sources		3	
	2.2 Total water consumption per capita.		3	
	2.3. Resource raw materials: per capita / GDP / resource balance		2	
Final assessment		0.15	8	1.2
3. The state of social capital	3.1 Accessibility of medical care;		2	
	3.2 Income equality, gender equality;		2	
	3.3 The level of crime;		1	
	3.4 Level of press freedom, level of freedom;		2	
	3.5 Level of satisfaction: individual happiness, satisfaction with public service, suicide rate		2	
Final assessment		0.2	9	1.8
4. The state of intellectual capital	3.1 Availability of educational institutions		2	
	3.2. Number of applications for utility models in the tourism field		1	
	6.2. Number of employees performing research in the tourism industry		1	
	2.3 Number of PhDs employed in the tourism industry		1	
	2.4. Number of doctors of sciences employed in the tourism industry		1	
	3.3. The level of compliance of organisational culture with the innovative development of tourism enterprises		2	
Final assessment		0.15	8	1.2
5. Economic sustainability level	5.1 Business environment, infrastructure, legal security, availability of finance		2	
	5.2. Business competitiveness: sectoral balance; economic focus; business diversity		2	
	5.3 Female participation: women in management; economic diversity;		1	
	5.4. Financial market: stability; legal framework		2	
	5.5. Economic indicators: market indicators; GNI (gross national income)		2	
Final assessment		0.15	9	1.53
6. Efficiency of public administration	6.1. Government cohesion: state budget, military spending; public services		2	
	6.2. Infrastructure: investment; roads and railways		2	
	6.3 Business environment: investment; business registration		2	
	6.4 Corruption: corruption index; bribery		2	
	6.5 Financial stability: vulnerability to financial shocks; rigour; financial regulations		1	
Final assessment		0.15	9	1.53

$$P_k = \sum P_i * W_i = 1,56 + 1,2 + 1,8 + 1,2 + 1,53 + 1,53 = 8,82$$

Table 2 presents the results of the components of the indicator reflecting the systemic and comprehensive preconditions for tourism industry development in Czechia.

Tab. 2. Components of the indicator of systemic and complex prerequisites for the tourism industry's development in Czechia

Ingredients	Parameters	Bara Weight	City of Prague	
			Points (1-3)	A balanced assessment

1. Attraction of domestic and foreign investment in the tourism industry in actual prices, million crowns	7. 1 Investments in the tourism industry, in actual prices, MSEK million. 8.1. The state of the labour market 8.2. The level of development of productive forces and the state of the investment market; 8.3. Political will of the authorities and the state's legal framework; 8.4. The state of the financial and credit system and the activities of financial intermediaries; 8.5. Status of foreign investors		2 2 2 2 1	
Final assessment		0.15	11	1.43
2. Scientific and technical capabilities	3.1. Level of expenditure on research and development in the tourism sector 3.2. Number of new types of tourist services 3.3. Number of new technologies 3.4. Share of staff engaged in R&D in the total number of staff		2 2 1 1	
Final assessment		0.12	6	0.72
3. Forecasting consumer purchasing power	9.1. Phase of the country's economic cycle; 9.2. Inflation rate; 9.3. Employment rate of the population; 9.10. The volume of gross national product; 9.11. Consumer needs.		1 2 2 2 2	
Final assessment		0.18	9	1.62
4. Using international experience in tourism management	10.1. Inclusive tourism implementation; 10.2. Implementation of best practices in the digital technologies field; 10.3. Use of mutually beneficial cooperation between countries.		2 2 2	
Final assessment		0.2	6	1.2
5. The non-governmental sector role	11.1. Sponsorship; 11.2. Geopolitical location; 11.3. Favourable climatic conditions; 11.4. Network of transport links		1 2 2 2	
Final score		0.2	7	1.4
6. Development of European integration processes	12.1. The existence of a functional market economy; 12.2. Adherence to the principles of freedom, democracy, respect for human rights and fundamental freedoms, and the rule of law; 12.3. Respect for and protection of minorities; 12.4. Ability to assume obligations consistent with the EU's political, economic and monetary objectives; 12.5. Reflection of EU legislation in national legislation.		2 2 2 2 2	
Final assessment		0.15	10	1.5

$$P_n = \sum P_i * W_i = 1,5 + 1,4 + 1,2 + 1,62 + 0,72 + 1,43 = 7,87$$

Integral indicator of the tourism industry's competitiveness in Czechia.

$$P_e = \sqrt{8,32 * 7,87} = 8,33$$

The integral indicator of the tourism industry's competitiveness in Czechia is 8.33, which represents a high level on the evaluation scale. The assessment results show that the development of tourism infrastructure in Czechia is actively supported. This methodology can also be used to calculate an integral index for the regions of Czechia and the city of Prague. Table 3 presents the integral indicator of tourism industry competitiveness by region and for Prague.

Tab 3. Integral indicator of the tourism industry's competitiveness in Czechia's regions

Czechia regions	Integral indicator	The value of a potential assessment
City of Prague	8.93	high level
South Moravian	6.56	medium level
Hradec Králové	5.00	medium level
South Bohemia	4.09	medium level
Central Bohemia	4.03	low level
Karlovarský	3.99	low level
Liberec	3.87	low level
Moravian-Silesian	3.37	low level
Plzeňský	2.78	low level
Zlínský	2.68	low level
Olomouc	2.47	low level
Vysočina	2.18	low level
Ústí nad Labem	2.03	low level
Pardubice	1.77	low level

Source: calculated by the authors

Figure 3 shows a choropleth map of Czechia that visualizes the integral competitiveness indicators of the tourism industry by region. It provides a clear view of areas with strong and weak tourism development.

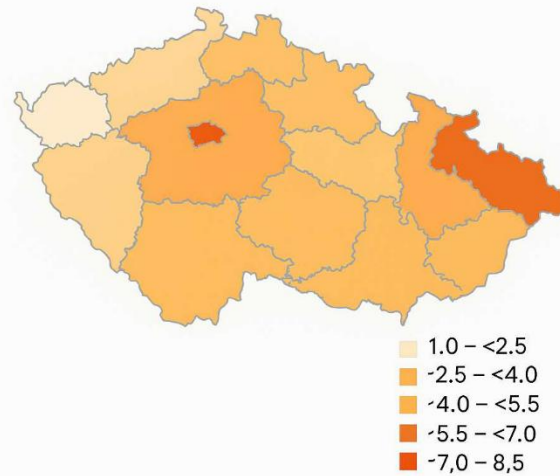


Fig. 3. Czechia's choropleth map of competitiveness indicators by region [developed by the authors]

The integral indicator of tourism industry competitiveness in Czechia's regions was calculated using expert assessments and statistical data. Prague scored the highest with 8.93 points, while the Pardubice region had the lowest score of 1.77 points. Because the weights used can be subjective, a factor analysis was conducted to reduce bias and provide a more objective assessment. The analysis showed the following indicators have the greatest impact on tourism competitiveness, with their respective weights:

- Investment in tourism infrastructure: 0.25
- Quality of tourism services: 0.20
- Technological innovations: 0.15
- Environmental sustainability: 0.15
- Social capital: 0.10
- Macroeconomic conditions: 0.10
- Financial competitiveness: 0.05

Sensitivity analysis revealed that adjusting these weights affects the overall competitiveness score. For example, increasing the weight of investment in tourism infrastructure by 10% results in a 5% increase in the overall score. This highlights the critical role of investment in tourism development. The study concludes that to boost the competitiveness of Czechia's tourism industry, priority should be given to infrastructure investment, service quality improvement, technological innovation, and environmental sustainability. The calculation of the integral indicator along with factor and sensitivity analyses helps produce more objective results and supports the creation of effective development strategies for Czechia's tourism regions.

Compared to its neighbours (Slovakia, Hungary, and Poland) Czechia shows a higher level of consistency in researching and measuring tourism competitiveness, with an integral index of 8.33. The country focuses on innovation, digitalization, and environmental sustainability. Poland's strength lies in its extensive participation in EU programs, while Hungary actively develops its branding and thermal resorts. Slovakia has high natural and recreational potential but struggles with infrastructure challenges. This comparison helps assess Czechia's strategic position in Central Europe and highlights areas for further growth and development.

The practical policy recommendations based on the Czechia tourism competitiveness assessment model offer a comprehensive approach to addressing regional imbalances and strengthening strategic integration with European initiatives. Key priorities include:

- i. Targeted investments in infrastructure for lagging regions such as Pardubice, Ústí, and Zlín.
- ii. Digitalization of tourism, by promoting smart tourism and supporting small and medium-sized businesses in adopting digital solutions.
- iii. Environmental transformation aligned with the European Green Deal, including establishing an 'eco-region' standard to certify tourist facilities—such as accommodations, transport, and eco-trails—that meet EU environmental requirements.
- iv. Development of regional branding through the creation of branding hubs and partnerships with platforms like Booking.com, TripAdvisor, and EU Travel Tech to attract foreign tourists to new regions.

- v. Modernization of human resources and interregional coordination, including regional retraining programs under the European Reskill & Upskill initiative targeting hotel and restaurant workers, tour guides, and event organizers.

These programs should integrate modules on environmental management, cultural sensitivity, and digital skills.

Discussion

The assessment of Czechia's tourism industry competitiveness revealed several key areas needing improvement. The study suggests a systematic approach that can be adapted to travellers' needs, encouraging repeat visits to various regions. Using technology in regional development strategies must be well-planned and tailored to local conditions. However, technology alone is not a complete solution—its impact depends on how effectively it is implemented and integrated.

Regions like South Moravian, Kralovehradecky, and Southern Czechia have average tourism potential and must improve their appeal. Most other regions – except Prague and especially Pardubice – have low tourism potential, pointing to weak tourism development and the need to revise their strategies.

The development of geotourism, which leverages the country's unique geological heritage and Earth resource sites, can serve as a catalyst for attracting visitors to less popular regions and diversifying tourism offerings.

Studies have shown that domestic tourism trends positively influence industry competitiveness (Prychepa et al., 2022). Emerging tools such as smart personal assistants – like Google Assistant and Apple Siri – could support new competitive models (Phaosathianphan and Leelasantham, 2022). Similarly, the introduction of Business Intelligence (BI) systems (Nyanga et al., 2020) offers flexible ways to collect and analyse tourist data, boosting competitiveness. However, privacy risks related to data use must be carefully managed.

High-performing tourism areas – such as large cities with diverse tourism offerings and mountain destinations with cultural attractions – highlight the value of developing such sites (Grassini et al., 2023). Tourist satisfaction must be prioritized by creating engaging routes that showcase local attractions (Chiriko et al., 2021). Additionally, the language skills and professionalism of tourism workers play a vital role in boosting quality (Tleuberdinova et al., 2022).

Regional economic development has the strongest influence on tourism competitiveness (Zhang et al., 2023). Strengthening the position of already competitive regions, offering substitute services, reducing tourism costs, and increasing advertising can further improve outcomes (But, 2024a). Forming clusters of countries with similar tourism potential also supports competitive advantage (Kapustina et al., 2017).

Sustainability is another key factor. Eco-friendly accommodation (Tothova et al., 2022), green transport options, green hotel initiatives (Szczepańska-Woszczyzna et al., 2024), adaptive performance (Salim et al., 2024) and promoting ecotourism help raise competitiveness. Geotourism, as a form of sustainable tourism, not only supports environmental protection but also fosters public engagement with natural sciences and regional identity (Li et al., 2024); (Iannaccone et al., 2025). Digitalizing tourism services not only enhances tourist experiences but also supports labour market growth and improves general welfare (But, 2024b).

Despite the wide use of the Diamond models by Porter (1998), Ritchie & Crouch (1999), and Dwyer & Kim (1999) in tourism planning, these models have several methodological and practical limitations when used to assess competitiveness.

Porter's model is static. It does not reflect the fast-changing nature of today's economies, especially under digitalisation and globalisation. It also downplays the role of institutional factors such as political stability, legal systems, and cultural values, which strongly influence tourism attractiveness.

The Ritchie & Crouch model focuses mainly on supply-side factors. This may cause it to overlook important tourist behaviours, motivations, and expectations. Although the Dwyer & Kim model includes both supply and demand factors, it lacks a clear method for assigning weight to these factors, which introduces the risk of subjectivity.

To address these issues, this study developed a new model for assessing competitiveness. It uses a systematic approach based on an integral factor and emphasises strong coordination among tourism stakeholders and the tourism system as a whole. The proposed model fits well within the EU's strategic framework, especially the goals of the European Green Deal and cohesion policy. Its priorities – investment in environmental infrastructure, digitalisation, and innovation – align closely with EU goals for sustainable tourism and climate neutrality by 2050. The model's focus on regional inequalities and the use of an integral indicator also create opportunities to attract funding from EU sources such as the ERDF and ESF+. These funds can support regional development, boost the tourism appeal of less developed areas, and promote socio-economic cohesion.

Future research will explore several key areas. These include the impact of technological innovations, environmental sustainability, socio-economic effects of tourism, investment efficiency, financial competitiveness, marketing strategies and branding, global event impacts, and tourist behaviour and trends.

Together, these areas will provide a deeper understanding of the Czechia tourism industry and support the creation of effective strategies for long-term growth.

Conclusions

The empirical results of this study show that the competitiveness of Czechia's tourism industry is shaped by a complex mix of macroeconomic, resource-based, and technological factors. Regional imbalances in tourist flows and structural instability highlight the urgent need for better strategic planning and adaptability. Despite these challenges, the industry continues to grow at different levels, as reflected in its high scores on the Travel & Tourism Development Index (TTDI).

Tourism competitiveness is not only driven by economic factors. It also reflects deeper social and cultural dynamics. Tourism connects the goals of learning, cultural exchange, and economic progress, making it a strong indicator of overall societal development. In this study, the competitiveness of Czechia's tourism industry was assessed based on its ability to create favourable conditions for tourism services, apply international quality standards, and align with European and global values.

Czechia has all the key resources needed for further growth in tourism. Its rich history and cultural heritage, combined with scientific and technological development, give it high tourism potential. The industry's competitiveness depends on its capacity for research and development, scientific progress, and its success in attracting both domestic and foreign investment.

To boost this competitiveness, investment in infrastructure, adoption of innovative technologies, and promotion of environmentally sustainable tourism practices are essential. The findings of this study highlight the need for an integrated development approach—one that balances economic, social, and environmental factors to ensure long-term growth of the tourism industry.

This study developed a comprehensive model for assessing the competitiveness of Czechia's tourism industry. The model includes macroeconomic, resource-based, technological, and environmental factors, while also accounting for regional differences. The calculated integral index of 8.33 shows a high level of overall competitiveness. However, the results also reveal major regional gaps – with Prague scoring the highest (8.93), while peripheral regions like Pardubice lag far behind (1.77).

Factor and sensitivity analyses confirmed the key role of investment in tourism infrastructure, service quality, innovation, and environmental sustainability. These are critical areas that influence the industry's competitiveness.

To further increase the region's competitiveness and promote sustainable tourism, the study recommends the strategic development of geotourism, a type of tourism that focuses on geological heritage, environmental education, and local involvement. Key recommendations include: mapping and promotion of geological sites; integration with educational and scientific institutions; local geotourism initiatives; sustainable infrastructure development; and cross-border cooperation.

The study proposes several practical policy recommendations. These include the creation of a National Fund for Regional Tourism Support, digital transformation, eco-region standardisation, regional branding, staff training, and better coordination between regions. These measures align with the goals of the European Green Deal and EU cohesion policy and offer a pathway to secure funding under the 2021–2027 EU programmes.

The model not only assesses the current state of the tourism industry but also supports strategic planning at both the national and regional levels. The competitiveness of Czechia's tourism sector will only be fully realised when all regions reach a competitive standard, creating a strong synergistic effect.

The originality of this study lies in its development of an integral indicator that reflects systemic coordination between tourism market actors and the overall tourism system. It provides clear directions for improving industry competitiveness.

The study's practical significance lies in the use of this integral indicator as a tool for attracting investment to different regions. It supports the rapid and sustainable growth of tourism, both domestically and internationally, while helping the industry adapt to global standards and integration in an increasingly globalised economy.

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