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Article

Exploring the competitiveness of tourism in Hungary: Recent findings and results

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Abstract: This research evaluates the regionalization of tourism in Hungary, revealing the breakdown of the national gross domestic product (GDP) of tourism. It also explores the density, spatial variations, and features of these indicators. A multimodal approach is used to evaluate the competitiveness of Hungarian counties, and the distribution of these tourism regions is analyzed using the tourism penetration index. Furthermore, regional GDP is calculated for the whole territory of Hungary. The study identifies significant regional disparities in tourism competitiveness, highlighting Budapest-Central Danube as the most competitive region and Lake Balaton as underperforming despite its potential. The research contributes by providing a detailed regional GDP analysis and emphasizing the need for targeted policy interventions to enhance tourism development across all regions.

Keywords: tourism regions; counties; tourism GDP; tourism penetration index

1. Introduction

The analysis of the competitiveness of various tourism regions presents numerous challenges (Lengyel, 2000; Nemes Nagy, 2005). Despite the identification of several characteristics that enhance the competitiveness of tourism destinations in multiple studies (Dwyer and Kim, 2003; Ritchie and Crouch, 2003), the methods available for measuring tourism competitiveness are still somewhat limited. Research has nevertheless been carried out on this subject. According to Go and Govers (2000), the competitive standing of a destination depends on factors such as its amenities, ease of access, service quality, reputation, climate, surroundings, and attractions. Furthermore, Ritchie and Crouch (2003) emphasized the need to consider the relative significance of these attributes for various sectors of tourism industry. Ritchie's (2003) Destination Performance Index allows for the comparison of destinations by evaluating around 160 indicators related to economic performance, sustainability, visitor satisfaction, and management activities.

Gooroochurn and Sugiyarto's (2004) Competitiveness Monitor evaluates tourism competitiveness using eight quantitative indicators, including prices, trade openness, technological development, infrastructure, tourism-related human resources, social

development, environmental conditions, and overall human resources. However, the annual variability in country rankings complicates the identification of trends (Jancsik and Madarász, 2009; Moravec et al., 2024; Tóth et al., 2024a, 2024b).

The Travel and Tourism Competitiveness Index (WEF, 2008) evaluates the tourism competitiveness of 130 countries based on 14 indicators, categorized into three main themes: regulatory framework, business environment and infrastructure, and human, cultural, and natural resources. Káposzta et al. (2013) have shown that the development of tourism infrastructure and the efficient use of related funds can significantly contribute to improving the competitiveness of rural areas in Hungary. Bede and Luu (2011) emphasized the importance of destination policy and administration that should focus on improving infrastructure and organizing special events to promote the destination's culture and history, thus maintaining competitiveness (Dávid and Szűcs, 2009; Gavurova et al., 2023). In their study Lakner et al. (2018) showed how coalitions can be formed for sustainability in tourism development.

The ESPON (2007) report provides a comprehensive analysis of tourism flows and their regional significance, along with a categorization of destinations. It integrates the tourism index and typologies with metrics such as population growth, GDP, employment, accessibility, and risks, emphasizing regional disparities through the Tourism Penetration Index (TPI).

This comprehensive study explores the competitiveness of tourism destinations within Hungary, integrating innovative aspects like regionalization, the distribution of national tourism GDP, and an analysis of Hungarian counties' competitiveness. Utilizing a multimodal approach, the study considers various indicators to offer a detailed view of Hungary's tourism landscape's current status and future potential. This summary emphasizes recent discoveries regarding the competitiveness of Hungarian tourism destinations. Considering the rapid changes in the global tourism industry, it is essential to comprehend the factors that boost destination appeal and competitiveness for sustainable development and effective strategic planning. The study employs the latest data and analysis to assess Hungary's tourism destinations' current state. Our article assesses the regionalization of Hungary's tourist destinations and analyzes the distribution of national tourism GDP. (refer to Tafel and Szolnoki (2020), Figini and Patuelli (2022), Bujdosó et al. (2019) for similar analyses). Additionally, it investigates the distribution, spatial inequalities, and features of these indicators to identify patterns influencing the competitiveness of each region. A significant aspect of this research is the use of the Tourism Penetration Index to examine the extent of tourism regions in Hungary. By using this index, the study dissects the competitiveness of Hungarian counties, identifying their strengths and areas needing improvement. This multimodal approach not only offers a comprehensive view of tourism competitiveness but also provides valuable insights for ecological and regional policymakers and stakeholders (Cheng et al., 2023).

2. Materials and methods

We calculated the GDP for different tourism regions across Hungary from 2012 to 2022 (**Figure 1**) to assess their development levels. These estimates align with those for smaller Hungarian regions discussed subsequently.

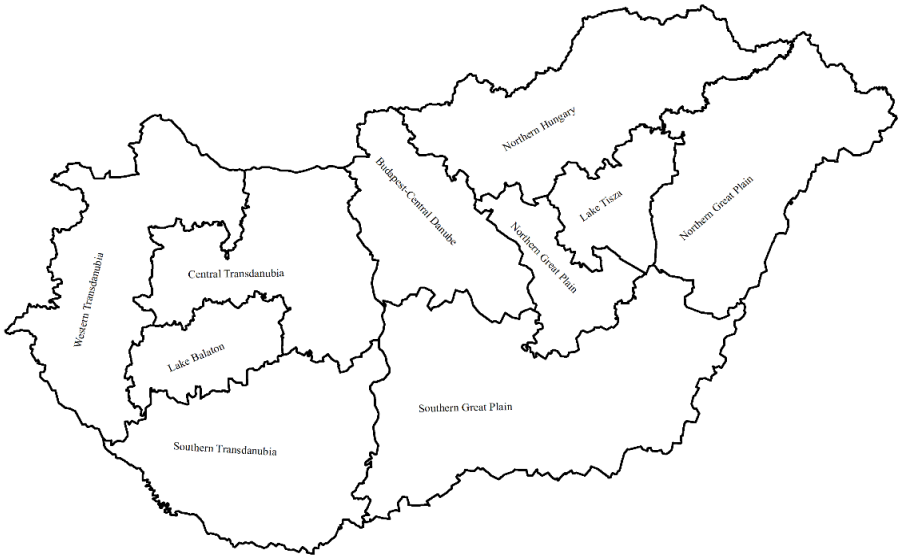

Figure 1. Tourism regions in Hungary.

First, we identified the proportion of municipalities within the tourism regions being studied by analyzing the total taxable income of the counties, the volume of local taxes, and the number of registered businesses. By averaging these proportions, we estimated the GDP for each municipality based on the county's GDP figures provided by the Central Statistical Office. Using the average of these proportions, we calculated the GDP of each municipality as a part of the county's total GDP, based on data from the Central Statistical Office. These municipal GDP estimates were then aggregated by tourism region. For comparability, we also performed these calculations at the county level.

Subsequently, the national tourism GDP was apportioned among the tourism regions through an estimation method that relies on the turnover of accommodation establishments in each region, sorted by accommodation type. In addition to tourism regions, we also examined the situation and trends at the county level.

Theoretically, development levels can be assessed using a complex development indicator. However, estimating the GDP of tourism regions, a commonly used indicator, was deemed more appropriate for this analysis. The outcomes of these calculations are detailed below.

We have used ScapeToad software, a cross-platform application for creating of cartographs.

Within the framework of a multimodal approach, economic data, spatial analyses and the tourism penetration index were integrated to provide a comprehensive assessment of the competitiveness of tourism in Hungarian counties.

3. Results and discussion

3.1. GDP vs. tourism GDP

We assessed the overall GDP of Hungary's tourism regions and compared their development levels using these estimates and actual values. Among these regions, the Budapest-Central Danube region has the highest GDP. The share of GDP for the Western-Transdanubian region saw the most significant increase between 2012 and 2022, while other regions experienced smaller increases. Considering that the Budapest-Central Danube Region produces one-third of the national GDP, different regions do not match up as counterparts (**Figure 2**).

National GDP grew by 128% from 2012 to 2022. The fastest growth occurred in the Northern Hungary region (+220%), the Lake Tisza region (+147%), and the Southern Transdanubia region (+145%), with other regions growing more slowly than the national average. The Western Transdanubian region had the lowest growth (+111%). In terms of GDP per capita, Budapest-Central Danube region recorded above-average growth.

At the county level, Budapest has the highest GDP, accounting for 36% of the national total (**Figure 3**). Between 2012 and 2022, Pest (+163%), Fejér (+154%), and Veszprém (+152%) counties experienced the highest growth. In terms of GDP per capita, Budapest, Győr-Moson-Sopron, and Fejér counties are the most favorable.

In the graph, tourism regions' areas are adjusted by GDP volume, with coloring based on GDP per capita, designed using the Scapetoad program.

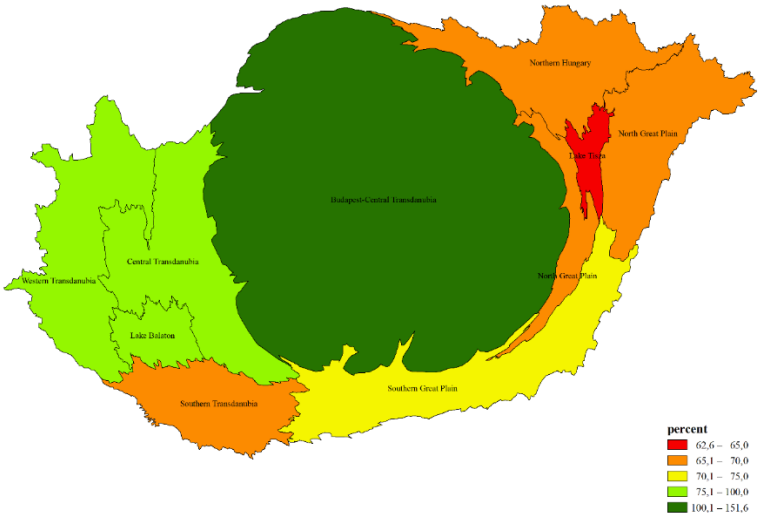

Figure 2. Topological map of GDP and GDP per capita of tourism regions in Hungary, 2022 (national average = 100).

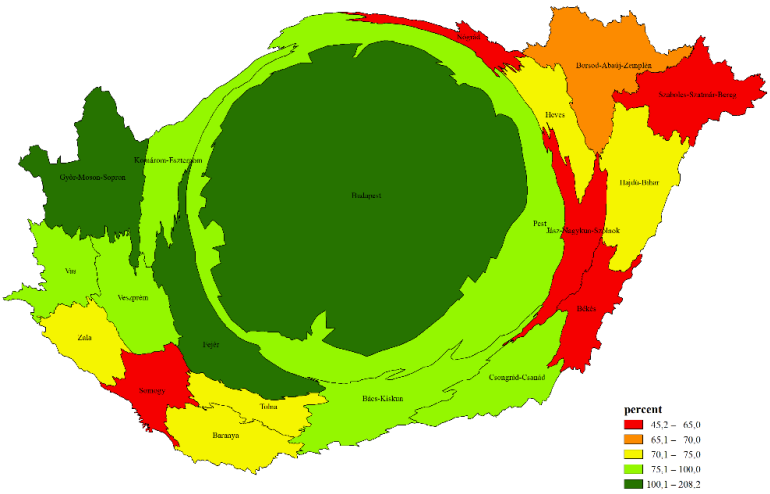

Figure 3. Topological map of GDP and GDP per capita in Hungarian counties, 2022 (national average = 100).

Tourism GDP grew by 167% nationally between 2012 and 2022 (**Figure 4**). The Western Transdanubian Region saw the most significant growth (+220%), while the Central Transdanubia Region had the smallest growth (+108%). Northern Hungary, Lake Balaton, and Southern Transdanubian regions saw growth rates below the national average. The leading four regions were Budapest-Central Danube, Lake Balaton, Western Transdanubia, and the North Great Plain. Budapest-Central Danube, Lake Balaton, Western Transdanubia, and North Great Plain. Northern Hungary, which was fifth in 2012, dropped to seventh by 2022. Central Transdanubia was followed by Southern Transdanubia in 2012. The Lake Tisza region had the lowest tourism GDP during this period.

At the county level (**Figure 5**), most tourism GDP is generated in Budapest, Zala, and Vas counties. The highest growth between 2012 and 2022 was seen in less prominent tourist destinations, such as Szabolcs-Szatmár-Bereg (+503%), Csongrád-Csanád (+408%), and Komárom-Esztergom (+367%). In terms of tourism GDP per capita, Zala County, Budapest, and Vas County are in the most favorable positions.

The results show that tourism GDP is much more regionally concentrated in Hungary compared to total GDP, with both types of concentration becoming increasingly intense. Moreover, the differences in tourism GDP per capita across regions are much more pronounced than those in overall GDP. Although the gap between the most and least developed regions is narrowing, substantial spatial differences in tourism development persist.

To enable comparisons across regions with different sizes and populations, the regional tourism GDP per capita was calculated and used as an indicator of tourism development. The ranking of tourism regions has remained relatively stable over time, with Lake Balaton, Budapest-Central Danube, and Western Transdanubia consistently occupying the top three positions. In the graph (**Figure 3**), the area of tourism regions has been adjusted by tourism GDP volume, while the coloring is based on tourism GDP per capita.

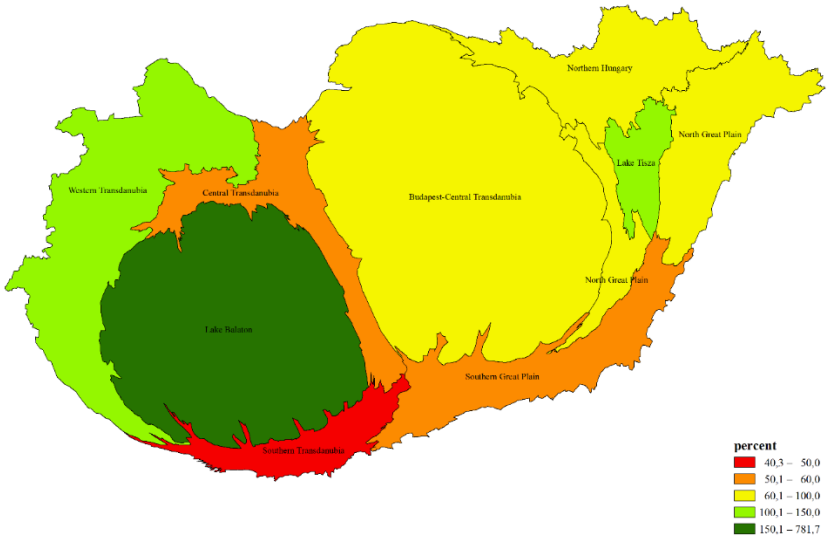

Figure 4. Topological map of tourism GDP and tourism GDP per capita in tourism regions in Hungary, 2022 (national average = 100).

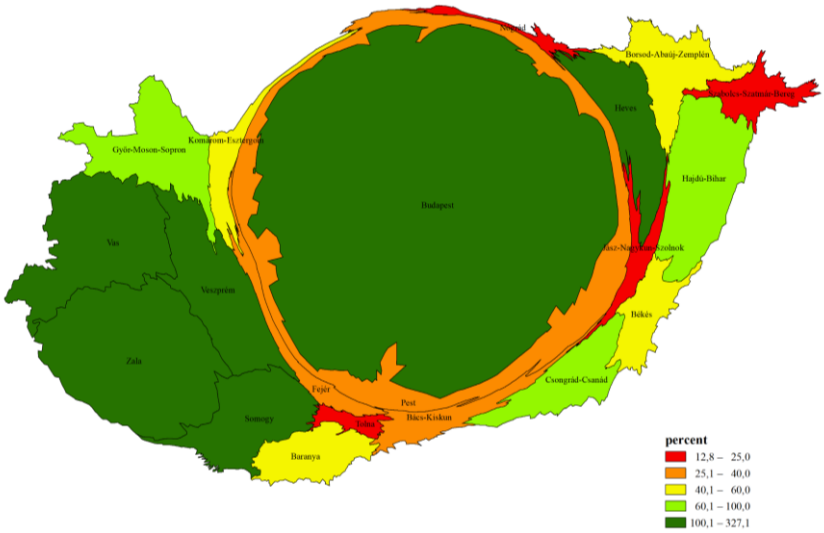

Figure 5. Topological map of tourism GDP and tourism GDP per capita in Hungarian counties, 2022 (national average = 100).

3.2. Tourism competitiveness and tourism penetration

Employing the disaggregation method, we examined the tourism competitiveness and its components across the various regions of Hungary. Initially, we considered several factors contributing to competitiveness: development (measured as GDP per capita), productivity (GDP per employed person), employment (ratio of working-age individuals to those employed), and age structure (working-age individuals per capita). After applying some mathematical adjustments, specifically logarithmising the values, we transformed the multiplication into a more manageable sum as indicated by the formula below:

$$\log\left(\frac{GDP}{number\ of\ population}\right) = \log\left(\frac{GDP}{number\ of\ employed}\right) + \log\left(\frac{number\ of\ employed}{number\ of\ active\ aged}\right) + \log\left(\frac{number\ of\ active\ aged}{number\ of\ population}\right) \quad (1)$$

By applying this method, we determined that the Budapest-Central Danube tourism region is the only one in Hungary classified as competitive. This

competitiveness is primarily attributed to the "employment" factor, indicating a multifaceted competitive advantage in this area. Conversely, no other tourism region exhibited a competitive advantage, and overall, no other region could be considered competitive in 2022.

In a dynamic analysis covering 2012 to 2022, the tourism regions of Northern Hungary, Lake Tisza, and Southern Hungary demonstrated a complex competitive advantage. Central and Southern Transdanubia also displayed a competitive edge, primarily due to favorable changes in productivity. No competitive advantage was evident in the other regions.

Tourism competitiveness was analyzed through two methods: (i) evaluating specific tourism factors, and (ii) assessing the current tourism situation in relation to the economic structure. The first method modeled tourism competitiveness using indicators such as tourism development (measured by per capita tourism GDP in the county), tourism efficiency (per capita GDP per guest-night in the county), coverage (per capita commercial accommodation), and capacity utilization (per guest-night).

From the analysis of these statistical tourism factors, regions like Lake Balaton, Lake Tisza, and Western Transdanubia were found to be competitive. For Lake Balaton, despite possessing a multifactorial competitive edge, the relative supply was below the average. Budapest-Central Danube, while leading Hungary in accommodation rankings, showed a per capita value below the national average, suggesting that tourism is less significant to its economy than it is for Lake Balaton. Lake Balaton demonstrated high accommodation values but experienced lower efficiency and occupancy rates. Other regions did not display any competitive advantage

Dynamic analysis revealed that the North Great Plain and Central Transdanubia regions have a well-developed competitive edge. Western Transdanubia and the Southern Great Plain regions show a competitive advantage across multiple factors. On the other hand, Budapest-Central Danube, Northern Hungary, and the Lake Tisza regions display a competitive advantage based on a single factor. Unfortunately, Southern Transdanubia faces a multifactorial competitive disadvantage, while Lake Balaton suffers from a complex competitive disadvantage.

Tourism, characterized by its complexity and multiple dimensions, requires analysis using a multidimensional indicator. The Tourism Penetration Index (TPI) was developed for this purpose as a comprehensive impact indicator of tourism (McElroy and de Albuquerque, 1998; Sütő, 2007).

Recognizing that tourism competitiveness is shaped by more than just tourism-specific factors, our second approach included the overall development level of the county and the share of tourism in total development. This implies that tourism competitiveness is gauged not only by per capita tourism income but also by the sector's role in the economy and regional development. The results were consistent, indicating that shifts in tourism dynamics are mirrored in its economic impact. As a result, tourism competitiveness was analyzed from two perspectives, and the tourism penetration of each region was assessed using the Tourism Penetration Index (TPI) (**Figure 4**).

Table 1. Surplus of tourism regions according to ESPON (2007), 2022.

Destination type	TPI indices	Tourist regions
Mellow destination	0.50–1.00	Balaton region
Moderately high saturated destination	0.25–0.49	
Moderately low saturated destination	0.10–0.24	Budapest-Central Danube, Western Danube Region
Low saturated destination	0.00–0.09	Northern Hungary, Northern Great Plain, Lake Tisza, Southern Great Plain, Central Transdanubia, Southern Transdanubia, South Transdanubia Dunántúl

Our calculations utilized data from ESPON (2007) (**Table 1**) and a map of natural breakpoints and national spatial disparities (**Figure 6**). Using this approach, the Southern Great Plain is the region least impacted by tourism surplus, whereas Lake Balaton is the most impacted. The Budapest-Central Danube Region leads in economic impact but ranks second in tourism surplus. The Western Transdanubia Region holds third place based on these factors. Compared to previous studies (Dávid-Tóth, 2011), there has been a shift, with Budapest-Central Danube moving from the Medium-High saturation group to the Medium-Low saturation group, while other regions remained in the same group. In essence, tourism penetration remains stable, and the impacts of potential regional developments are gradually being realized.

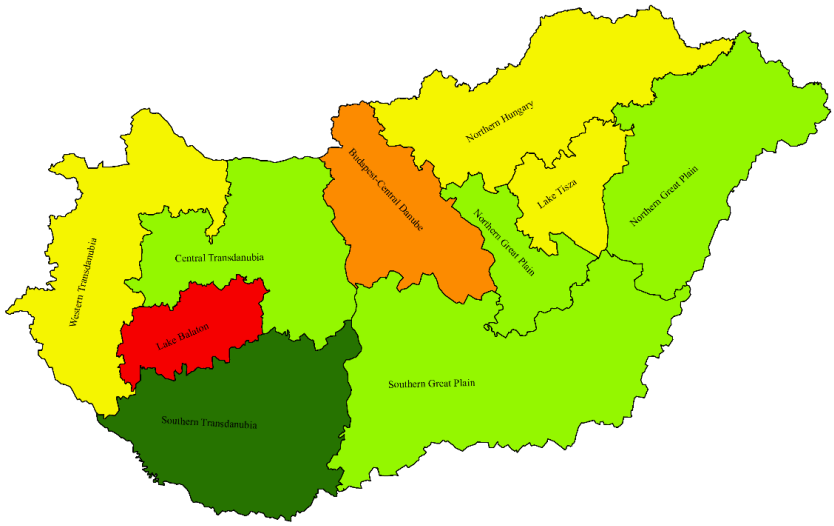

Figure 6. TPI indices of tourism regions in Hungary.

4. Discussion

This study analyzed the tourism competitiveness of Hungary's regions using a multifaceted approach. The findings reveal notable differences in the competitiveness of various regions, influenced by factors such as economic development, employment, and tourism infrastructure.

The Budapest-Central Danube region emerges as the most competitive characterized by high GDP per capita and robust economic development. This region's multi-factor competitive advantage stems from high employment rates and

productivity. In contrast, despite being a major tourist destination, Lake Balaton has a lower tourism GDP per capita, suggesting that the tourism sector in this region is not fully maximizing its potential compared to others.

The dynamic analysis from 2012 to 2022 shows significant improvements in tourism competitiveness in regions like Northern Hungary, Lake Tisza, and Southern Hungary. These regions have developed complex competitive advantages, transitioning from regions without a competitive edge, indicating successful investments in tourism infrastructure.

Using the Tourism Penetration Index (TPI), the Budapest-Central Danube region emerges as the most competitive. In dynamic analysis, Northern Hungary, Lake Tisza, and Southern Hungary also display complex competitive advantages.

5. Conclusion

Comparing our findings with previous studies on competitiveness, it is evident that Lake Balaton, Hungary's second-largest tourist destination, faces a heavier burden in terms of visitor arrivals than its domestic tourism competitiveness position suggests. This is due to the comparatively low success rate of tourism activities in the Balaton region, as reflected in the below-average tourism GDP per guest-night. Therefore, decision-makers need to develop a robust tourism development strategy for this area.

Conversely, in the Budapest-Central Danube region, development can proceed through greenfield projects and new investments, given its outstanding competitiveness factors at the national level. Although the region experiences moderately high tourism congestion, the emphasis should be on quality development and upgrading existing infrastructure.

For Lake Balaton, the goal should not only be to increase visitor numbers but also to enhance service quality despite the high congestion levels. The Budapest-Central Danube Region, encompassing Budapest, outperforms in both the economic and tourism sectors there is potential to increase tourist traffic in other regions, considering congestion levels.

Apart from the unique situations of these two major tourism regions, it is important to highlight the potential future challenges for the Northern Great Plain and its counties. Economically, this region is at a competitive disadvantage, although it presents a mixed tourism scenario: a 2006 static study indicated a competitive disadvantage, whereas the dynamic analysis from 2012 to 2022 revealed a complex competitive advantage. Despite the current economic disadvantage, the region's level of tourism development is notable. Policymakers bear significant responsibility for this region, as tourism can drive development in economically underdeveloped areas. Maintaining these positive trends is crucial, as future increases in tourism workload must be managed to prevent negative socio-economic and environmental impacts.

The primary limitation of this research is the reliance on available economic data, which may not capture all dimensions of tourism competitiveness, such as cultural and social factors. Additionally, the study's focus on regional GDP and the tourism penetration index may overlook other important indicators of tourism performance. Future research should incorporate more diverse data sources and qualitative methods

to provide a more holistic view of tourism competitiveness, and also consider longitudinal studies to track changes over time.

Author contributions: Conceptualization, GT and LDD; methodology, GT; software, GT; validation, LDD; formal analysis, IVG; investigation, GT and LDD; resources, GT and IVG; data curation, LDD; writing—original draft preparation, GT; writing—review and editing, GT, IVG and LDD; visualization, GT; supervision, LDD; project administration, IVG; funding acquisition, LDD. All authors have read and agreed to the published version of the manuscript

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