Journal of multidisciplinary academic tourism
2025, 10 (2): 225-239
https://doi.org/10.31822/jomat.2025-10-2-225
ISSN: 2645-9078

Examination of travel and tourism development levels of the Mediterranean Countries with multicriteria decision making methods

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Keywords:
Mediterranean Countries,
World Economic Forum,
Travel and Tourism Development Index,
WASPAS,
TODIM.

Article History:
Submitted: 02.06.2024
Revised:21.09.2024
Accepted: 04.04.2025
Published Online: 04.04.2025

ABSTRACT

This study aims to examine the tourism development levels of the countries in the Mediterranean region according to the Travel and Tourism Development Index (TTDI) published by the World Economic Forum (WEF) using multi-criteria decision-making methods. For this purpose, the study compares the Travel and Tourism Development levels of the countries bordering the Mediterranean Sea according to 5 main criteria and 17 sub-criteria in the index. In this context, the importance weights of the index criteria were calculated by taking expert opinions with the AHP method and the Mediterranean countries with data in the index were ranked by TODIM and WASPAS methods. After the expert opinions, it was determined that the most important criteria were Environmental Conditions, Travel and Tourism Policies and Conditions, Travel and Tourism Demand Drivers, Infrastructure and Sustainability of Travel and Tourism. According to the results of the WASPAS method, the development levels of 8 countries differed from the WEF data, while according to the TODIM method, differences were observed in the rankings of 6 countries. In line with the results of the study, it is concluded that Mediterranean countries can maintain their ranking if they give more weight to important criteria that affect tourism development such as Environmental Conditions, Travel and Tourism Policies and Conditions and Travel and Tourism Demand Pressure.

1. Introduction

Tourism has a sensitive characteristic due to its interdisciplinary structure and social, economic, natural or political reasons (Baggio, 2007; Holden, 2008). While social factors were more effective in the formation of tourism in the early periods, economic and political reasons started to come to the fore in the following centuries (Sharpley & Telfer, 2008). Today, economic and technological factors continue to affect the supply and demand elements of the tourism industry more intensely (Kozak *et al.*, 2023).

Tourism regions or countries that have the necessary infrastructure and superstructure, especially accommodation, transportation and entertainment facilities, which contain various elements of attraction in terms of tourism (Kozak & Sop, 2023). Tourism regions face increasing competition from other tourism regions as well as from other recreational products and consumer durables (Ritchie & Crouch, 2003). Therefore, each tourism region has to compete with other regions for a larger share of the total tourism market (İçöz *et al.*, 2019). Tourism revenues and the number of tourists have increased continuously over the years, especially after the Industrial Revolution (Gierczak, 2011). According to the United Nations World Tourism Organization (UNWTO, 2018), the number of tourists was 531 million in 1995, 680 million in 2000, 952 million in 2010, and 1,239 million in 2016. After the global Covid-19 pandemic in 2020, this figure, which was 459 million in 2021, reached 975 million in 2022, showing a slight recovery. By the end of 2023, international arrivals had returned to 88% of pre-pandemic levels at 1.3 billion (UNWTO, 2024a).

In this study, it is aimed to analyze the tourism development levels of 19 countries in the Mediterranean region with multi-criteria decision making methods. For this purpose, criterion weighting was carried out by taking expert opinions on 5 main criteria and 17 sub-criteria in the Travel and Tourism Development Index prepared by the World Economic Forum (WEF). A pairwise comparison matrix suitable for AHP analysis was created for 13 experts with knowledge in the relevant field and consistency tests of these matrices were performed. For the purpose of the

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Table 1: Data on the Countries Hosting the Most Tourists in the World

Ranking	Country	2019	Country	2020	Country	2021	Country	2022
1	France	90,2	France	41,70	France	48,40	France	79,4
2	Spain	83,8	İtaly	25,19	Mexico	33,86	Spain	71,65
3	USA	78,7	Mexico	24,28	Spain	31,18	Usa	50,87
4	China	67,5	Usa	19,21	Türkiye	29,92	Türkiye	50,45
5	Italy	64,6	Spain	18,93	Italy	26,88	Italy	49,81
6	Türkiye	52,5	Türkiye	15,89	Usa	22,10	Mexico	38,32
7	Mexico	44,9	Austria	15,09	Greece	14,70	Germany	28,46
8	Thailand	39,7	Germany	12,44	Austria	12,72	Greece	27,83
9	England	39,9	England	10,71	Arab Emirates	11,47	Austria	26,21
10	Germany	39,4	Poland	8,41	Germany	11,68	Arab Emirates	22,65

Source: *Adopted by the Author's according to UNWTO (2023) data.*

research, a decision matrix has been created to analyze the data of 19 countries in the Travel and Tourism Development Index, which are located on the Mediterranean coast. In the study, the data of 19 Mediterranean countries were ranked with WASPAS and TODIM methods, which are among the Multi-Criteria Decision Making Methods (MCDM). In addition, the results of the WEF were also compared with the results of WASPAS and TODIM methods through correlation analysis. Finally, sensitivity analysis is applied to test whether there are differences between the rankings in scenarios where the criteria weights are changed. In the concluding section of the study, recommendations for improving Türkiye's competitiveness are presented based on the index data.

General And International Tourism

UNWTO (2024b) defines tourism as the "social, cultural and economic phenomenon that requires people to move to countries or places outside their usual environment for personal or business/occupational purposes". In another definition, tourism defines as the "processes, activities, and outcomes arising from the relationships and the interactions among tourists, tourism suppliers, host governments, host communities, and surrounding environments that are involved in the attracting and hosting of visitors" (Goeldner & Ritchie, 2012, p. 4).

Tourism is analyzed in two dimensions: system approach and industrial approach (İçöz *et al.,* 2019). When considered as a system, there are three basic elements. These elements consist of the region sending tourists, transportation and the region receiving tourists (Cooper & Hall, 2008). According to the system approach, tourism does not only consist of tourists and businesses that meet the needs of tourists. The governments that are part of the process and the social, economic and environmental impacts of the process should not be ignored (Roney, 2018). For many years, tourism has been recognized as an industry around the world and it has been assumed that this industry falls within the service sector (İçoz *et al.,* 2019). When tourism is examined from an industrial perspective, it consists of 5 dimensions: accommodation sector, recreation enterprises, transportation sector, travel enterprises and destination management organizations (Middleton & Clarke, 2001).

According to UNWTO 2022 data, while approximately 1,466 billion tourists traveled all over the world in 2019, this figure decreased to 409 million as a result of restrictions due to the global Covid-19 outbreak in 2020 (UNWTO, 2022). In 2022, 963 million tourists traveled, while in 2021, when the effects of the pandemic continued, the number of tourists traveling continued at a flat level and 459 million people traveled (UNWTO, 2023). As a result of the impact of vaccination on a global scale and the lifting of travel restrictions, the number of tourists participating in the tourism movement reached 975 million by the end of 2022 (UNWTO, 2024a). Table 1 presents data on the top 10 countries hosting the most tourists in the world.

When table 1 is analyzed, it is seen that France is the country hosting the highest number of tourists all over the world in 2019, 2020, 2021 and 2022, while the other rankings vary from period to period. Spain, which ranked 2nd in 2019, ranked 5th in 2020 and 3rd in 2021, while in 2022, it is seen that it has risen back to its 2019 ranking. Likewise, it is seen that the USA, which ranked 3rd in 2019, ranked 4th in 2020 and 6th in 2021, and in 2022, it rose back to its 2019 ranking. When Table 1 is analyzed, it is seen that while Türkiye ranked 6th with 52.5 million tourists in 2019, it maintained its ranking in the 2020 pandemic and increased the number of tourists by rising to 4th place in 2021 and 2022.

The fact that tourism makes a significant contribution to national economies and offers a fast-growing market leads all countries to make various efforts to get a share of the tourism pie and increases competition among destinations globally (Kozak *et al.,* 2023). In general terms, destination competitiveness is defined as "the ability of destinations to use their natural, cultural, human and man-made resources efficiently to develop and deliver high quality, innovative, ethical and attractive tourism products and services to achieve sustainable growth" (UNWTO, 2024c). According to Ritchie and Crouch (2003), the most important factors that make a destination more competitive than its competitors are the spending on tourism, the ability to attract more visitors while providing visitors with satisfying experiences, and the well-being of local people

Table 2: Top 10 Countries Generating the Most Income from Tourism

Ranking	Country	2019	Country	2020	Country	2021	Country	2022
1	USA	198.980	USA	72.481	USA	70.215	USA	135.215
2	Spain	79,670	France	32.564	France	40.802	Spain	72.889
3	France	63.507	United Kingdom	26.614	Spain	34.541	United Kingdom	68.165
4	Thailand	59.810	Australia	25.820	Arab Emirates	34.445	France	59.675
5	United Kingdom	58.591	Arab Emirates	24.615	United Kingdom	33.144	Italy	44.312
6	Italy	49.596	Germany	22.103	Türkiye	26.634	Türkiye	41.176
7	Japan	46.054	Italy	19.797	Italy	25.151	Germany	31.547
8	Australia	45.522	Spain	18.507	Germany	22.267	Mexico	28.016
9	Germany	41.807	Austria	13.848	Mexico	19.765	Canada	24.034
10	Macao (China)	40.060	Canada	13.582	Australia	16.988	Saudi Arabia	23.475

Source: *Adopted by the Author's according to UNWTO, (2023) data.*

and the preservation of the natural environment for future generations. Table 2 presents data on countries revenues from tourism between 2019 and 2022.

When table 2 is examined, it is seen that America is the country that generates the highest income from tourism in the period between 2019 and 2022. While Spain was the 2nd country with the highest income in 2019, it ranked 8th in 2020, when the Covid-19 outbreak occurred, and in 2021, it recovered a little more and rose to 3rd place. According to the 2022 data, it has risen back to the 2nd place it achieved in 2019 and it is seen that it is approaching 2019 in terms.

Travel And Tourism Development Index

Another study to determine the tourism development levels of countries is the "Travel and Tourism Competitiveness Index" report prepared by the World Economic Forum (World Economic Forum [WEF], 2007) and first published in 2007. The report, which was updated every two years after 2007 and published by the World Economic Forum (WEF), was not released in 2020 due to the global COVID-19 pandemic. It was subsequently re-published in 2022 under the title Travel and Tourism Development Index (TTDI) (WEF, 2022a). The new report published in 2022 emphasized "Sustainability". The report ranks 117 countries under 17 different headings, revealing the factors that contribute to the sustainable development and thus competitiveness of countries through the travel and tourism industry.

The majority of the TTDI dataset is derived from statistical data provided by international organizations, while the remaining portion is based on survey data from the World Economic Forum. The Forum utilizes its annual executive opinion survey to assess qualitative concepts, and only countries with accessible data are included in this survey. The data for this analysis were sourced from various organizations, including Bloom Consulting, AirDNA, Euromonitor International, ICAO, IATA, the International

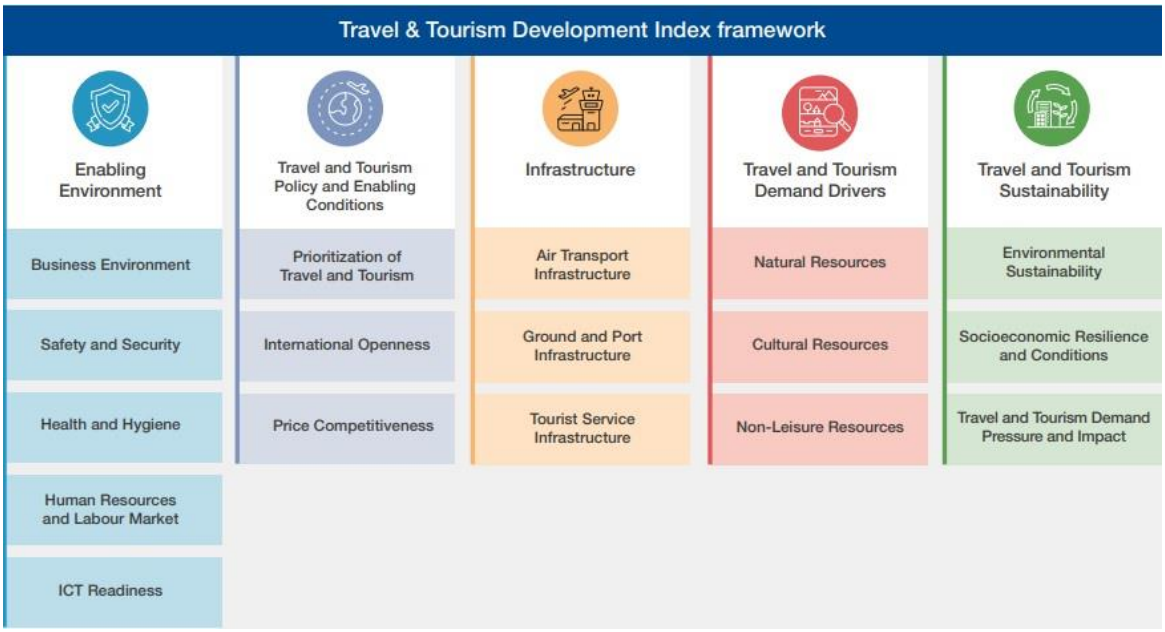

Figure 1: Criterias in TTDI

Source: *WEF (2022a).*

Table 3: Criterias and Descriptions

Criteria / Subcriteria	Description
Enabling Environment	
Busines Environment	It shows the extent to which a country has a favorable policy environment for entrepreneurs.
Safety and Security	It indicates the extent to which a country exposes locals, tourists and businesses to security risks.
Health and Hygiene	Indicates health infrastructure, accessibility and level of hygiene.
Human Resources and Labor Market	It indicates the presence of qualified employees in the sector and the dynamism, efficiency and productivity of the labor market.
ICT Readiness	Indicates the development and utilization level of ICT infrastructure and digital services.
Travel and Tourism Policy and Enabling Conditions	
Prioritization of Travel and Tourism	Indicates the extent to which governments actively promote tourism development and investments in tourism development.
International Opennes	It indicates how open a country is to providing tourist services to visitors. The development of the travel and tourism industry at the international level requires a certain degree of openness and ease of travel.
Price Competitiveness	It refers to how costly it is to travel or invest in a country. Lower costs associated with tourism in a country increase the attractiveness of that country for many travelers, while making the tourism industry more attractive to investors.
Infrastrusture	
Air Transport Infrastructure	Airline transportation infrastructure is very important for travelers to be able to travel to many countries as well as providing convenience for travelers to enter and exit countries.
Ground and Port Infrastructure	Indicates land and port transportation facilities accessible to major business centers and tourist attractions.
Tourist Service Infrastructure	Indicates the availability and competitive position of basic tourism services such as accommodation and car rental.
Travel and Tourism Demand Drivers	
Natural Resources	Indicates the level of development of outdoor tourism activities as well as existing natural resources. Natural resources are defined as landscape, national parks and fauna richness.
Cultural Resources	It indicates cultural amenities such as archaeological sites and recreational facilities. To a certain extent, it also shows how cultural resources are protected, developed and promoted.
Non-Leisure Resources	It refers to the extent and attractiveness of business and other non-leisure travel, which accounts for a significant share of tourism revenue. Online research on business, academic and medical travel are also some of a country's non-leisure resources.
Travel and Tourism Sustainibility	
Environmental Sustainibility	It indicates the overall sustainability of a region's natural environment, the protection of its natural resources, its level of defense against climate change and its readiness for it.
Socioeconomic Resilience and Conditions	It reflects a country's socioeconomic prosperity and resilience. Gender equality is important for the inclusion of a diverse workforce, greater workers' rights and training, reducing the number of young adults unable to participate in employment or education, increasing worker productivity and creating a larger and higher quality labor pool.
Travel and Tourism Demand Pressure and Impact	It refers to the quality and impact of tourism, as well as the presence of overcrowding and volatile demand, and the factors that can manage these risks. Poorly managed tourism development can lead to destinations operating above capacity, resulting in overcrowding, damaged natural and cultural resources, problematic infrastructure, rising housing prices and overall reduced life satisfaction for local people.

Source: *Adopted by the Author's according to WEF (2022a) data.*

Telecommunication Union (ITU), the International Labor Organization (ILO), STR, the International Union for the Conservation of Nature (IUCN), Tripadvisor, UNESCO, UNWTO, the UN Statistics Division, the World Health Organization (WHO), the CIA World Factbook, the World Bank, WTTC, WTO, and the World Database on Protected Areas (WDPA).

The 5 main criteria and 17 sub-criteria in the index express a large number of characteristics. Table 3 provides detailed information on the characteristics of each sub-criterion.

In general, TTDI scores for successive indicators are normalized and rated on a common scale. The data are rated on a scale of 1-7, where 1=extremely weak and 7=extremely strong. The formulas used in the normalization process can be seen in equation (1) and equation (2).

$$6x\left(\frac{\text{country score}-\text{minimum sample}}{\text{maksimum sample}-\text{minimum sample}}\right)+1 \quad \textbf{(1)}$$

$$-6x\left(\frac{\text{country score}-\text{minimum sample}}{\text{maksimum sample}-\text{minimum sample}}\right)+7 \quad \textbf{(2)}$$

Minimum sample and maximum sample are the lowest and highest scores of the overall sample. For fixed data indicators, where a higher value indicates a worse outcome (e.g. fuel price levels), a normalization formula is used that converts the series from 1 to 7 as well as inverting it. Thus, 1 and 7 correspond to the worst and the best. Table 4 presents the results of the ranking of the travel and tourism development levels of the countries bordering the Mediterranean Sea according to the index data. This data also forms the basis of the decision matrix to be used in the following stages of the research.

2. Literature Review

In this section, the studies analyzed as a result of the literature review conducted in "Tr Index", "Google Scholar", "Scopus" and "Web of Science" databases are included. The competitiveness and tourism development levels of the Mediterranean region destinations were determined as the starting point of this study. The keywords for the articles examined within the scope of the research are "Tourism Development", "Sustainable Tourism Development", "Destination Competiveness", "Mediterranean Destinations", "Travel and Tourism

Table 4: Ranking of Mediterranean Destinations According to Travel and Tourism Development Index Data

	Country	Busines Environment	Safety and Security	Health and Hygiene	Human Resources and Labour Market	ICT Readness	Prioritization of Travel and Tourism	International Openness	Price Cpmpetitiveness	Air Transport Infrastructure	Ground and Post Infrastructure	Touristic Service Infrastructure	Natural Resources	Cultural Resources	Non-Leisure Resources	Environmental Sustainibility	Socioeconomic Resilience and Conditions	Travel and Tourism Demand Pressure and Impact
1	Spain	4.2	6	5.8	4.7	5.9	4.6	5.8	4.4	5.3	5.1	6.1	5.1	6.5	4.9	4.3	5.3	3.8
2	France	4.7	5.6	6.2	4.9	5.9	3.9	5.7	4	5.1	5.6	5.4	5.4	5.9	5.1	4.7	5.7	3.4
3	Italy	3.9	5.5	6	4.8	5.5	4.2	5.5	4	4.8	4.8	5.8	4.8	6.5	4.3	4.3	5.4	3.7
4	Portugal	4.2	6.3	6	4.7	5.7	4.2	5.3	4.2	4.4	4.5	6.3	3.5	4.3	3.7	4.2	5.5	3.8
5	Greece	3.6	5.4	6.1	4.6	5.6	5.2	5.3	3.8	4.5	4	5.6	3	3.3	3.1	4.4	4.8	3.4
6	Cyprus	4.5	5.9	5.3	4.9	5.9	5.2	5.3	4.3	4.1	3.3	5.6	1.7	2,1	2.9	4.3	5.3	4.1
7	Malta	4.3	5.7	5.7	4.9	5.9	5	5.3	4.2	3.9	3.9	5.3	1.7	2	1.9	4.3	5.3	4.2
8	Slovenia	4	6.3	5.6	4.6	5.6	5.1	4.8	4.6	2.1	4.9	4.9	2.5	2.3	1.7	4.8	6	3.1
9	Türkiye	3.8	4.8	4.8	4.4	5.2	4.4	3.4	6	5	4	4.2	2.8	4.4	4.1	3.6	3.7	3.5
10	Croatia	3.2	6	5.8	4.1	5.5	4.3	4.7	4.3	3.2	4.1	6.4	3.6	2.8	1.9	4.5	5.1	2.8
11	Israel	4.6	5.5	6	5.3	6	4.1	4.2	2.4	4	4.6	4.4	1.9	2.4	3.5	3.9	4.6	4.4
12	Egypt	4.6	5.5	4	4.4	4.9	5.6	2.6	6.2	4.1	4	2.9	3.1	3.6	2.6	4.2	3.9	4.5
13	Montenegro	3.7	5.7	5.3	4.3	5.1	4.6	3.4	5	2.6	3.5	5.7	1.8	1.5	1.2	4	4.5	4
14	Serbia	3.8	5.7	5.6	4.2	5.1	3.2	4.1	5.3	3.2	3.7	3.6	1.6	2.1	1.9	3.8	4.4	3.7
15	Morocco	4.1	5.6	3.7	3.7	4.7	4.8	3.2	5.3	3.4	3.4	3.2	2.3	2.8	3	3.8	3.7	3.8
16	Albania	3.8	5.6	4.7	4.7	4.7	4.6	3.1	5.3	2.7	3.3	3.8	2.1	1.8	1.6	4.4	4.7	3.4
17	Tunusia	3.7	5	4.4	4	4.3	4.9	2.3	6	2.6	2.8	3.2	2	2.1	2.8	3.8	4	3.3
18	Lebanon	3	4.6	4.4	3.9	4.4	4.7	2.8	3.8	3.3	2.2	3	1.3	2	2.9	3.2	3.7	4.1
19	Bosnia-Herzegiova	3	5.4	4.9	3.5	4.6	3.3	2.6	5.4	2.2	2.8	3.5	1.7	1.8	1.6	3.5	4.4	3.3
Criteria Direction		max	max	max	max	max	max	max	max	max	max	max	max	max	max	max	max	max

Adopted by the Author's according to WEF (2022b) data.

Competitiveness Index", "Travel and Tourism Development Index", "World Economic Forum". Firstly, Gooroochurn and Sugiyarto (2005) proposed a new competition model consisting of 8 main criteria and 23 sub-criteria to measure the competitiveness levels of more than 200 countries. In the model, the data obtained from the countries were first normalized and then difference tests were applied. Kayar and Kozak (2010) also compared Türkiye's competitiveness with other EU member countries by utilizing WEF 2007 data. In this study, clustering method and multidimensional scaling methods were utilized. Popescu and Pavlovic (2013) examined the competitive position of Serbias against Hungary, Slovenia, Bulgaria, Croatia, Romania, Montenegro and Albania according to WEF 2008, 2009, 2011 and 2013 data. Content analysis method was utilized in this study. Hassan and Uşaklı (2013) examined the competitiveness levels of eight destinations in the Mediterranean area (Türkiye, Greece, Italy, France, Spain, Morocco, Tunisia and Egypt). In this study, multidimensional scaling analysis was conducted on 14 variables. Aydemir, Saylan & Aydoğmuş (2014) aimed to determine the determinants of Türkiye's competitiveness against European countries in terms of tourism sector by utilizing 2013 WEF data in their study. Content analysis method was utilized in this study. Nazmfar et al. (2019) aimed to examine the tourism competitiveness of Middle Eastern countries based on WEF 2015 and 2017 data. In this study, destinations were ranked using the PROMETHEE method. Güllü and Yılmaz (2020) ranked the competitiveness levels of 10 Mediterranean countries using WEF's 2019 data. In this study, criteria weights were calculated with ENTROPY and destinations were ranked with EDAS method. Manap Davras (2020) aimed to examine the competitiveness levels of tourism destinations in the Mediterranean countries. In this study, criterion weights were calculated with AHP and destinations were ranked according to their competitiveness levels with TOPSIS and VIKOR methods. Rodrigues-Diaz & Pulido-Fernandez, (2020) developed an alternative methodology based on the reference point approach for measuring the tourism competitiveness of countries for WEF. The new method proposed by the authors is compared with the results after the method used by WEF. Sakal (2021) utilizes the WEF 2019 data and offers suggestions for increasing Türkiye's competitiveness based on its position in international tourism competition. In this study, content analysis was conducted using WEF's 2015, 2017 and 2019 data. Martinez-Gonzalez, Diaz-

Padilla & Parra-Lopez (2021) aimed to examine Portugal's competitiveness using WEF (2019) data and to analyze the validity and reliability of the WEF model. In this study, Rash Mathematical modeling method was used. Özkaya & Demirhan (2022) compared the competitiveness of European and Eurasian destinations according to WEF data. In this study, destinations were ranked using ENTROPY based VIKOR and K-means method. Babat et al. (2023) aimed to measure the competitiveness of Romania against Bulgaria and Hungary using WEF (2019) data. Content analysis method was utilized in this study. Gonzalez-Rodriguez, Diaz-Fernandez & Pulido-Pavon (2023) examined the competitiveness of 137 countries with data in WEF according to Ritchie and Crouch's (2003) destination competitiveness model. Data Envelopment Analysis and K-Means methods were utilized in this study.

To summarize, it is seen that there are many studies in the national and international literature on the WEF data. In the related studies, it is seen that the majority of the studies examine the competitiveness levels of certain countries by utilizing WEF data. In addition to making use of content analysis and difference tests in general, the competitiveness of countries have also been compared with Multi-Criteria Decision Making methods by changing the importance levels of the criteria in the WEF report.

3. Methodology

Tourism is primarily a vital industry for the social and environmental development of local communities (Grasso & Sergi, 2021). Since ancient times, the Mediterranean is connected peoples from different countries, facilitating facilitating both cultural exchange and trade (Ruggieri, 2011). Countries in the Mediterranean area also constitute tourism destinations visited primarily by tourists from all over the world (Buhalis, 1998).

This study aims to examine the tourism development levels of tourism destinations in the Mediterranean region using Multi-Criteria Decision Making Methods (MCDM). The sub-objective of the research is whether there are differences in the research findings as a result of obtaining objective criteria weights and subjective criteria weights obtained as a result of expert opinions. It is important for tourism planning to examine the sustainable tourism development levels of tourism destinations in the Mediterranean region where tourism competition is intense, to determine their position in the tourism market and to determine the level of protection of natural resources.

In research, the population includes all persons or items about which research is conducted (Pandey & Pandey, 2015). Sampling, on the other hand, is the process of forming a large group selected for a study, that is, a smaller number of groups that are thought to best represent the characteristics of the population (Wahyu Nurhayati, 2020). The universe of this research consists of 117 countries whose tourism development levels are examined in the Travel and Tourism Development Index published by the WEF in 2022. The sample of this research consists of 19 countries that have data in the index and have a coast to the Mediterranean Sea. Especially after the Covid-19 pandemic, destinations on the Mediterranean coasts of Southern Europe, North Africa and the Middle East, which are located in the Mediterranean region, have shown an extraordinary development (UNWTO, 2024a).

For the purpose of this study, a questionnaire form was prepared according to the 1-9 pairwise comparison matrix proposed by Saaty (1990) based on the main and sub-criteria in the index. In the first stage of this three-stage study, the criteria included in the Travel and Tourism Development Index were determined and based on these criteria, the Mediterranean region destinations whose tourism development level will be compared were identified. Accordingly, countries with Mediterranean coastline and Türkiye's competitors such as Italy, Spain, France, Greece, Croatia and Egypt were included in the study. The questionnaire form prepared in Phase 1 of the research was compared bilaterally by 13 PhD academics with expertise in the field of tourism. The areas of specialization of the academicians whose opinions were consulted consist of different fields of tourism such as Tourism Marketing, Tourism Sociology, Tourism Guidance, Sustainable Tourism and Gastronomy. The expert opinions obtained with the AHP method were obtained by delivering them to the experts digitally between 20.09.2023-31.10.2023. The ethics committee permission needed during the process of obtaining expert opinions was obtained from Selcuk University Faculty of Tourism Ethics Committee Commission on 04.09.2023 with the number 585048.

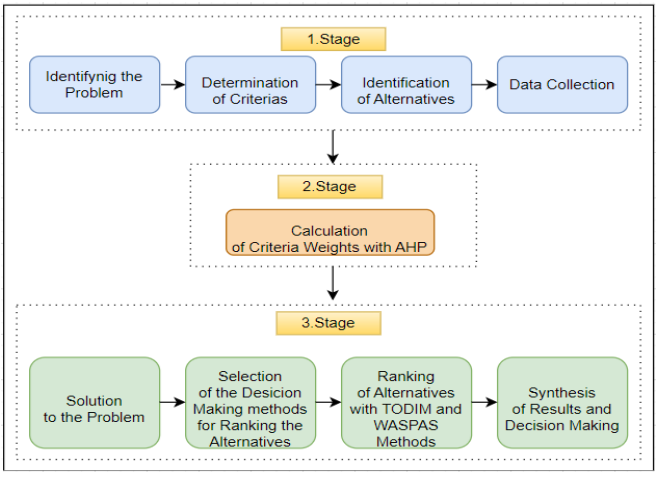

Figure 2: Process Flow Chart

In Phase 2 of the research, the AHP questionnaire obtained by the experts was analyzed and the local and global weights of the criteria obtained were calculated. In Phase 3 of the research, the destinations were ranked first with the TODIM method and then with the WASPAS method by utilizing the criteria weights obtained with the AHP

method. In Phase 3, the findings of the WEF were compared with the rankings obtained from the TODIM and WASPAS methods. Finally, a correlation analysis was first performed for the results of the WEF Ranking and the TODIM and WASPAS methods, and a sensitivity analysis was performed for the findings of the TODIM and WASPAS methods. In research, the index criterias are coded as C1, C2, C3, C52, C53 and the countries indicating the alternatives are coded as A1, A2, A3, A18, 19.

Analytic Hierarchy Process

In this study, the Analytic Hierarchy Process (AHP) method was used to determine the importance weights of TTDI criteria. Developed by Thomas L. Saaty to address strategic problems, AHP is a multi-criteria decision-making approach that integrates both quantitative and qualitative criteria (Saaty, 1977). This method allows for the incorporation of the preferences, intuitions, experiences, judgments, knowledge and thougts of individuals or groups into the decision-making process, thereby facilitating the resolution of complex problems within a hierarchical framework (Saaty, 1990). This method is used in selection problems, resource allocation problems, benchmarking problems and prioritization problems (Özdemir, 2016). Information on the stages in which the importance weights of the criteria are determined is given below.

Stage 1: Creating the Hierarchical Structure

In AHP, the objective of the decision problem is determined as the first stage. Then the factors affecting the objective are determined.

Stage 2: Creating the Pairwise Comparison Matrix

The second stage of AHP is comparative judgments or pairwise comparisons. Pairwise comparison matrixes of the degrees of importance between criteria and sub-criteria are created.

Table 5: Table of Importance Levels Used in Comparisons

Importance Value	Definition
1	Both options have equal importance
3	One criterion was considered slightly more important than the other
5	One criterion was considered more important than the other
7	The criterion is certainly more important than the other criterion
9	Where one criterion is extremely important compared to the other based on various information.
2,4,6,8,	Intermediate (Average) values

Table 5 shows the degrees of importance used when making comparisons in AHP. When using the AHP method, criterias and alternatives are compared pairwise by experts. Saaty's 1-9 scale is often used in this comparison. The scale takes 1/9 as the lowest value, 1 as the equal value and 9 as the highest value (Saaty & Vargas, 2012).

Stage 3: Creating the Normalized Decision Matrix and Finding the Relative Weight Vector

After the pairwise comparison matrix is created, the importance level of each compared element is calculated. For this calculation, the pairwise comparison matrix is normalized and the weight vector is found. To normalize the matrix, the criterion at each level of the matrix is divided by the sum of the columns.

$$A = \begin{bmatrix} 1 & a_{12} \cdots & a_{1n} \\ \vdots & 1 \ddots & \vdots \\ 1/a_n & 1/a_2 \cdots & 1 \end{bmatrix} \quad \textbf{(3)}$$

Stage 4: Calculation of Consistency Ratio

In order to ensure the consistency of the criteria and the accuracy of their importance weights, two coefficients are used: Consistency Index (CI) and Consistency Ratio (CR).

$$\text{Consistency Indicator (CI)} = \frac{(\lambda \text{max} - \text{n})}{(\text{n}-1)} \quad \textbf{(4)}$$

To calculate the consistency ratio, the consistency index data is divided by the Randomness Index (RI). RI varies according to the size of the comparison matrix. RI can vary according to the size of the comparison matrix. The formula for the consistency ratio is given in the following equation.

$$\text{Consistency Ratio} = \frac{\text{Consistency Indicator}}{\text{Randomness Indicator}} = \frac{\text{CI}}{\text{RI}} \quad \textbf{(5)}$$

A consistency ratio of less than 0.1 is considered positive. If the ratio is greater than 0.1, a reassessment should be made.

WASPAS Method

WASPAS (Weighted Integrated Sum Product Assessment) method, which is one of the MCDM methods, was developed by Zavadskas et al. (2012) by combining the Weighted Sum Model (WSM) and Weighted Product Model (WPM) methods. The WASPAS method thus allows the optimization of other criteria to alternatives. The first application, the WSM method, is an application of the WSM method for the evaluation of a set of alternatives. The second application, WPM, is the evaluation of alternatives in terms of generalized exponential multiplicative criteria whose optimality is generally similar to the WSM method. The third common generalized criterion is the application of WASPAS, whose optimality is based on a weighted combination of additive and multiplicative methods, which allows to provide a more realistic situation and increase the ranking accuracy

Table 6: Random Consistency Index

N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RI	0	0	0,58	0,90	1,12	1,24	1,32	1,41	1,45	1,49	1,51	1,54	1,56	1,57	1,59

(Chakraborty *et al.*, 2015). The stages of application of the method are shown below.

Stage 1: Creating the Decision Matrix

At this stage, in the (mxn) dimensional decision matrix of the decision making problem with "m" alternatives and "n" criteria, xij: represents the performance value of the ith alternative under the jth criterion.

$$X = \begin{bmatrix} x_{11} & x_{12} & \dots & x_{1n} \\ x_{21} & x_{22} & \dots & x_{2n} \\ x_{m1} & x_{m2} & \dots & x_{mn} \end{bmatrix} \quad \textbf{(6)}$$

Stage 2: Normalization of the Decision Matrix

The decision matrix is normalized using the following two equations.

$$\bar{x}_{ij} = \frac{x_{ij}}{max_i x_{ij}} \qquad For\ Benefical\ Criteria \quad \textbf{(7)}$$

$$\bar{x}_{ij} = \frac{min_i x_{ij}}{x_{ij}} \qquad For\ Cost\ Criteria \quad \textbf{(8)}$$

Stage 3: Calculation of the Total Relative Importance of ith Alternative According to the Weighted Sum Model (WSM)

At this stage, the value of each ith alternative criterion is multiplied by the weight value of the relevant criterion. The equation for calculating the weighted total relative importance is given in equation (9).

Stage 3: Calculation of the Total Relative Importance of ith Alternative According to the Weighted Sum Model (WSM)

At this stage, the value of each ith alternative criterion is multiplied by the weight value of the relevant criterion. The equation for calculating the weighted total relative importance is given in equation (9).

$$Q_i^{(1)} = \sum_{j=1}^{n} \bar{x}_{ij} w_j \quad \textbf{(9)}$$

Stage 4: Calculating the Total Relative Importance of jth Alternative According to the Weighted Product Model (WPM)

At this stage, the value of each jth alternative criterion and the power of the weight of the relevant criterion are taken. The equation for calculating the value of each alternative is given in equation (10).

$$Q_i^{(2)} = \prod_{j=1}^{n} (\bar{x}_{ij})^{w_j} \quad \textbf{(10)}$$

Stage 5: Determination of Relative and Total Importance of Alternatives

The total relative importance of alternatives calculated according to WSM and WPM methods at this stage is given in equation (11).

$$Q_i = \lambda Q_i^{(1)} + (1-\lambda) Q_i^{(2)} = \lambda \sum_{j=1}^{n} \bar{x}_{ij}\, w_j + (1-\lambda) \prod_{j=1}^{n} (\bar{x}_{ij})^{w_j}, \lambda = 0, 0.1, \dots., 1 \quad \textbf{(11)}$$

TODIM method

TODIM Interactive and Multicriteria Decision Making (Tomada de Decisao Interativa Multicriterio) method proposed by Gomes & Lima (1991) is an MCDM method based on Prospect theory. TODIM is a method for decision making under risky conditions. The form of the value function in the method is similar to the loss and gain function of expectancy theory (Gomes & Rangel, 2009). This function reflects the behavioral characteristics of decision makers such as risk aversion and shows the degree of dominance of alternatives over each other (Llamazares, 2018). Consisting of 6 stages, the application steps of the TODIM method are given below (Liu & Teng, 2014).

Stage 1: Creating the Decision Matrix

The decision matrix is created as shown in equation (6).

Stage 2: Creating the Normalized Decision Matrix

The decision matrix is normalized separately by Equation (12) and Equation (13) for the benefit and cost criteria.

$$d_{ij} = \frac{x_{ij}}{\sum_{i=1}^{n} x_{ij}}, i = 1,2, \dots, m; j = 1, 2, \dots, n \quad \textbf{(12)}$$

$$d_{ij} = \frac{1/x_{ij}}{\sum_{i=1}^{n} 1/x_{ij}}, i = 1, \dots, m; j = 1, 2, \dots, n \quad \textbf{(13)}$$

Stage 3: Determination of Relative Weights of Criteria

According to the reference criterion, the reference criterion is selected to determine the criteria weights. Usually the criterion with the highest value or the most importance is chosen as the reference criterion. The relative weights are shown in equation (14).

$$w_{cr} = \frac{w_c}{w_r} \ (c = 1,2,3, \dots \dots n) \quad \textbf{(14)}$$

Stage 4: Determining the Degree of Superiority of Alternatives

$$\emptyset_c(A_j A_j) = \begin{cases} \sqrt{\frac{w_{rc}(X_{ic} - X_{jc})}{\sum_{c=1}^{m} w_{rc}}} & IF\ (X_{ic} - X_{jc}) > 0 \\ 0 & IF\ (X_{ic} - X_{jc}) = 0 \\ \frac{-1}{0} \quad \sqrt{\frac{(\sum_{c=1}^{m} w_{rc})\ (X_{jc} - X_{ic})}{w_{rc}}} & IF\ (X_{ic} - X_{jc}) < 0 \end{cases} \quad \textbf{(15)}$$

The comparative degree of dominance is calculated for each alternative. In other words, when alternative i evaluates alternative j according to criterion c, the expectation value is calculated. This value is calculated in three different ways according to whether the value is greater than zero, equal to zero or less than zero. The calculation method is shown below respectively.

Stage 5: Calculation of the Overall Dominance Rating

After calculating the degree of dominance of all alternatives with respect to each other, all degrees of dominance are summed. The expression for the overall degree of dominance is shown in equation (16).

$$\delta(A_i, A_j = \sum_{c=1}^{m} \phi_c (A_i, A_j) \quad \textbf{(16)}$$

Stage 6: Calculation of the Overall Dominance of Alternatives

The overall evaluation based on the dominance between alternatives is determined by normalizing the overall dominance values for each alternative. The rank order value of the alternatives is calculated as shown in equation (17).

$$\xi_i = \frac{\sum_{j=1}^{n} \delta (A_i - A_j) - min_i \left(\sum_{j=1}^{n} \delta (A_i - A_j)\right)}{max_i \sum_{c=1}^{n} \delta (A_i - A_j) - min_i \left(\sum_{j=1}^{n} \delta (A_i - A_j)\right)} \quad \textbf{(17)}$$

4. Findings

This section presents the findings obtained from the research for the purpose of the study. First of all, criterion weights were calculated with the AHP method, then the destinations were ranked first with the WASPAS method and then with the TODIM method. Correlation analysis was used to compare the consistency of the results.

Results of the Analytic Hierarchy Process Method

In the AHP method, the pairwise comparison matrices obtained from 13 experts were evaluated separately and the consistencies of the comparisons were determined. At the next stage, a group decision was taken and all evaluations were turned into a common decision. The Superdesicion program was also used to determine the importance levels of the main criterias and then the importance levels of the sub-criterias. In the last stage, the global weights of the criteria were obtained by multiplying the main criteria and sub-criteria with each other. Table 7 shows the findings of AHP method.

Table 7: AHP Method Results

Main Criterias	Main Criteria Weights	Sub criterias	Sub Criteria Weights	Global Weights
C1- Enabling Environment	0,2292	C11- Busines Environment	0,0931	0,0213
		C12- Safety and Security	0,3436	0,0787
		C13- Health and Hygiene	0,2621	0,0600
		C14- Human Resources and Labour Market	0,1590	0,0364
		C15- ICT Readiness	0,1420	0,0325
		Consistency: 0,05668		
C2- Travel and Tourism Policy and Enabling Conditions	0,2292	C21- Prioritization of Travel and Tourism	0,4126	0,0945
		C22- International Openness	0,3274	0,0750
		C23- Price Competitiveness	0,2599	0,0595
		Consistency: 0,05156		
C3- Infrastructure	0,1730	C31- Air Transport Infrastructure	0,6098	0,1055
		C32-Ground and Port Infrastructure	0,1655	0,0286
		C33- Tourist Service Infrastructure	0,2246	0,0388
		Consistency: 0,09040		
C4- Travel and Tourism Demand Drivers	0,1954	C41- Natural Resources	0,4434	0,0866
		C42- Cultural Resources	0,3873	0,0757
		C43- Non-Leisure Resources	0,1692	0,0330
		Consistency: 0,01759		
C5- Travel and Tourism Sustainibility	0,1730	C51- Environmental Sustainibility	0,3333	0,0576
		C52- Socioeconomic Resilience and Conditions	0,3333	0,0576
		C53- Travel and Tourism Demand Pressure and Impact	0,3333	0,0576
Consistency: 0,02607		*Consistency:* 0,00000		

Source: Authors' own elaboration

As a result of the AHP analysis in Table 7, the overall weights of each criterion are listed as follows; C31-Air Transportation Infrastructure (0.1055) > C21-Priority of Travel and Tourism (0.0945) > C41-Natural Resources (0.0866) > C12-Safety and Security (0.0787) > C42-Cultural Resources (0, 0757) > C22-Openness to the World (0.0750) > C13-Health and Hygiene (0.0600) > C23-Price

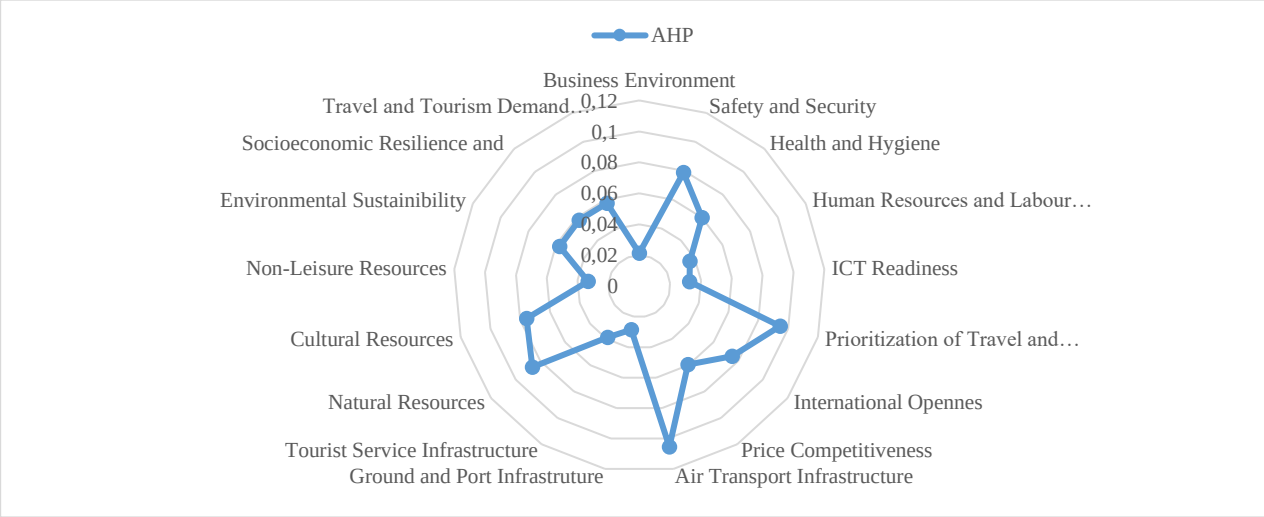

Figure 3: Radar Diagram of Criteria Weights

Source: Authors' own elaboration

Competitiveness (0.0595) > C51-Environmental Sustainability (0.0576) > C52-Socioeconomic Conditions (0, 0576) > C53-Travel and Tourism Demand Pressure and Impact (0.0576) > C33-Touristic Service Infrastructure (0.0388) > C14-Human Resources and Labor Market (0, 0364) > C43-Non Leisure Resources (0.0330) > C15-Information Technology Infrastructure (0.0325) > C32-Land and Port Infrastructure (0.0286) > C11-Business Environment (0.0213).

Results of the WASPAS Method

Table 8 shows the results of the WASPAS (QI) method obtained as a result of the WSM method given in Equation (15) and the WPM method given in Equation (16). In the study, λ value is assumed as 0.5 in the calculation of QI values.

Table 8: WASPAS Method Results

Destinations	WSM	WPM	QI	Ranking
A-1 Spain	0,9180	0,9156	0,9168	1
A-2 France	0,9006	0,8936	0,8971	2
A-3 Italy	0,8741	0,8707	0,8724	3
A-4 Portugal	0,8294	0,8221	0,8257	4
A-5 Greece	0,7904	0,7758	0,7831	5
A-6 Cyprus	0,7664	0,7226	0,7445	6
A-7 Malta	0,7535	0,7059	0,7297	10
A-8 Slovenia	0,7345	0,6889	0,7117	11
A-9 Türkiye	0,7494	0,7392	0,7443	7
A-10 Croatia	0,7430	0,7227	0,7328	9
A-11 Israel	0,7212	0,6839	0,7025	12
A-12 Egypt	0,7462	0,7219	0,7340	8
A-13 Montenegro	0,6667	0,6141	0,6404	15
A-14 Serbia	0,6590	0,6225	0,6407	14
A-15 Morocco	0,6716	0,6525	0,6620	13
A-16 Albania	0,6590	0,6209	0,6399	16
A-17 Tunusia	0,6289	0,5965	0,6127	17
A-18 Lebanon	0,6007	0,5654	0,5830	18
A-19 Bosnia-Herzegiova	0,5829	0,5470	0,5649	19

Source: Authors' own elaboration

When the destinations were analyzed according to their travel and tourism development levels with the WASPAS method, the following ranking was realized; A1-Spain (0,9168) > A2-France (0,8971) > A3-Italy (0,8724) > A4-Portugal (0,8257) > A5-Greece (0,7831) > A6-Cyprus (0,7445) > A9-Türkiye (0,7443) > A12-Egypt (0,7340) > A10-Croatia (0,7328) > A7-Malta (0,7297) >A8-Slovenia (0, 7117) > A11 - Israel (0.7025) > A15 - Morocco (0.6620) > A14 - Serbia (0.6407) > A13 - Montenegro (0.6404) > A16 - Albania (0.6399) > A17 - Tunisia (0.6127) > A18 - Lebanon (0.5830) > A19 - Bosnia and Herzegovina (0.5649).

Results of the TODIM Method

Table 9 presents the findings of the TODIM method whose formulas are given in Equation (21), Equation (22) and Equation (23).

Table 9: TODIM Method Results

Destinastions	Global Dominance G (AI)	Global Values V(AI)	Ranking
A-1 Spain	-9,2658	1,0000	1
A-2 France	-13,8916	0,9615	2
A-3 Italy	-23,1081	0,8847	3
A-4 Portugal	-23,5894	0,8807	4
A-5 Greece	-44,2443	0,7087	6
A-6 Cyprus	-41,1788	0,7342	5
A-7 Malta	-46,2748	0,6918	7
A-8 Slovenia	-55,1382	0,6180	9
A-9 Türkiye	-63,5054	0,5483	10
A-10 Croatia	-63,8978	0,5450	11
A-11 Israel	-51,5815	0,6476	8
A-12 Egypt	-64,8838	0,5368	12
A-13 Montenegro	-85,0206	0,3691	13
A-14 Serbia	-85,5972	0,3643	14
A-15 Morocco	-87,0241	0,3524	15
A-16 Albania	-87,6488	0,3472	16
A-17 Tunusia	-107,6704	0,1805	17
A-18 Lebanon	-128,7601	0,0048	18
A-19 Bosnia-Herzegiova	-129,3393	0,0000	19

Source: Authors' own elaboration

When the destinations were analyzed according to their travel and tourism development levels with the TODIM

method, the following ranking was realized; A1-Spain (1,0000) > A2-France (0,9515) > A3-Italy (0,8847) > A4-Portugal (0,8707) > A6-Cyprus (7342) > A5-Greece (0,7087) > A7-Malta (0,6818) > A11-Israel (0,6476) > A8-Slovenia (0,6180) > A9- Türkiye (0, 5483) > A10-Croatia (0,5450) > A12 - Egypt (0.5368) > A13 - Montenegro (0.3691) > A14 - Serbia (0.3643) > A15 - Morocco (0.3524) > A16 - Albania (0.3472) > A17 - Tunisia (0.1805) > A18 - Lebanon (0.0048) > A19 - Bosnia and Herzegovina (0.0000).

Correlation Analysis Findings

Correlation analysis was conducted using the results of WEF, TODIM and WASPAS methods to determine whether there is a significant relationship between the travel and tourism development level results of the countries in the Mediterranean basin. Correlation analysis is an analysis method to determine the level of relationship or dependence between two variables measured at the interval and ratio level (Senthilnathan, 2019). There are different types of correlation calculation methods. These methods are Pearson, Kendall's Tau-b and Spearman correlations. Pearson correlation, which is among the parametric tests, can be measured at least at the interval level. Spearman correlation is used in rank level measurements (El-Hashas & Ali Shiekh, 2022).

Table 10: Correlation Analysis Findings

			WEF Rank	TODIM	WASPAS
Spearman's rho	WEF Rank	Correlation Coefficient	1,000	,988**	,958**
		Sig. (2-tailed)	.	,000	,000
		N	19	19	19
	TODIM	Correlation Coefficient	,988**	1,000	,940**
		Sig. (2-tailed)	,000	.	,000
		N	19	19	19
	WASPAS	Correlation Coefficient	,958**	,940**	1,000
		Sig. (2-tailed)	,000	,000	.
		N	19	19	19

**. Correlation is significant at the 0.01 level (2-tailed).

According to the Spearman correlation analysis findings given in Table 10, the correlation coefficient between WEF Rank and Todim methods is 0.988, and the correlation coefficient between WEF Rank and WASPAS methods is 0.958. When the correlation coefficients of TODIM and WASPAS methods are analyzed, it is seen that there is a significance level of 0.958, and a significance level of 0.988 between TODIM and WEF Bwm methods. Based on these findings, it is seen that there is a high level of correlation between the results of both the analysis performed by WEF and the results of TODIM and WASPAS methods and similar results are realized in the ranking of alternatives.

Sensitivity Analysis

In this part of the study, sensitivity analysis was conducted to observe the outcome of the rankings when the importance weights of the criteria affecting tourism development are changed for both methods. Sensitivity analysis is a tool used to test the quality of a model or to improve the quality of an inference based on a model (Saltelli & Annoni, 2011). In other words, sensitivity analysis is used to determine how "sensitive" a model is to changes in the value of a model or its parameters and to changes in the structure of the model (Zhou & Lin, 2008). For this reason, the weights calculated as a result of Scenario 1, in which all criteria are considered to have equal weight with the current situation, Scenario 2, in which the weight values of the criteria with the highest weight and the criteria with the lowest weight are changed, and the MEREC method, which is one of the objective criterion weighting methods, are as shown in Table 11.

The rankings obtained by sensitivity analysis for WASPAS and TODIM methods are shown in Table 11. According to the sensitivity analysis results of the WASPAS method in the table, Alternative A1 ranks first in all 3 scenarios, while the rankings of Alternatives A2, A3, A4, A17, A18, A19 remain unchanged. On the other hand, it is noteworthy that alternatives A7, A8, A9, A10, A11, A12, A13 and A15 in

Table 11: Criteria Weights for Sensitivity Analysis

Criterias	Current Situation	Scenario 1	Scenario 2	MEREC
C11- Busines Environment	0,0213	0,0588	0,1055	0,0365
C12- Safety and Security	0,0787	0,0588	0,0787	0,0269
C13- Health and Hygiene	0,0600	0,0588	0,0600	0,0484
C14- Human Resources and Labour Market	0,0364	0,0588	0,0364	0,0328
C15- ICT Readiness	0,0325	0,0588	0,0325	0,0277
C21- Prioritization of Travel and Tourism	0,0945	0,0588	0,0945	0,0481
C22- International Openness	0,0750	0,0588	0,0750	0,0768
C23- Price Competitiveness	0,0595	0,0588	0,0595	0,0941
C31- Air Transport Infrastructure	0,1055	0,0588	0,0213	0,0740
C32-Ground and Port Infrastructure	0,0286	0,0588	0,0286	0,0772
C33- Tourist Service Infrastructure	0,0388	0,0588	0,0388	0,0616
C41- Natural Resources	0,0866	0,0588	0,0866	0,0903
C42- Cultural Resources	0,0757	0,0588	0,0757	0,0881
C43- Non-Leisure Resources	0,0330	0,0588	0,0330	0,1120
C51- Environmental Sustainibility	0,0576	0,0588	0,0576	0,0341
C52- Socioeconomic Resilience and Conditions	0,0576	0,0588	0,0576	0,0326
C53- Travel and Tourism Demand Pressure and Impact	0,0576	0,0588	0,0576	0,0390

Source: Authors' own elaboration

Table 12: Sensitivity Analysis Results

	WASPAS				TODIM			
Alternatives	**Current Situation**	**Scenario 1**	**Scenario 2**	**MEREC**	**Current Situation**	**Scenario 1**	**Scenario 2**	**MEREC**
A-1 Spain	1	1	1	1	1	1	1	1
A-2 France	2	2	2	2	2	2	2	2
A-3 Italy	3	3	3	3	3	3	3	4
A-4 Portugal	4	4	4	4	4	4	4	3
A-5 Greece	5	5	5	6	6	6	5	7
A-6 Cyprus	6	6	6	7	5	5	6	5
A-7 Malta	10	7	8	10	7	7	7	6
A-8 Slovenia	11	8	7	12	9	8	10	8
A-9 Türkiye	7	10	12	5	10	11	9	12
A-10 Croatia	9	11	10	9	11	10	11	10
A-11 Israel	12	9	11	11	8	9	8	9
A-12 Egypt	8	12	9	8	12	12	12	11
A-13 Montenegro	15	13	13	15	13	13	14	13
A-14 Serbia	14	14	16	14	14	15	13	15
A-15 Morocco	13	15	14	13	15	14	15	16
A-16 Albania	16	16	15	16	16	16	16	14
A-17 Tunusia	17	17	17	17	17	17	17	17
A-18 Lebanon	18	18	18	18	18	18	18	19
A-19 Bosnia-Herzegiova	19	19	19	19	19	19	19	18

Source: Authors' own elaboration

Scenario 1, alternatives A7, A8, A9, A10, A11, A12, A13, A14, A15 and A16 in Scenario 2, and alternatives A5, A6 and A10 according to the MEREC-based WASPAS method are sensitive to weight change.

According to the TODIM method results in Table 12, Alternative A1 and A2 ranks first in all three scenarios, while the rankings of Alternatives A3, A4, A5, A6, A7, 12, 13, A16, A17, A18 and A19 remain unchanged. On the other hand, the rankings of alternatives A8, A9, A10, A11, A14, A15 in Scenario 1, A8, A6, A8, A9, A13, A14 in Scenario 2, and A3, A4, A5, A7, A8, A9, A10, A11, A12, A14, A15, A16, A18, A19 according to MEREC-based TODIM method change. As a result of the sensitivity analysis of Scenario 1 and Scenario 2 based on AHP-WASPAS methods and the sensitivity analysis based on MEREC-WASPAS method, it is seen that alternative A8 and A19 is the most sensitive to weight change.

As a result of the analyses carried out to determine the travel and tourism development levels of the Mediterranean countries, the ranking results of the countries obtained from the MCDM methods are shown collectively in Figure 4. When Figure 4 is examined, it is noteworthy that the country rankings are the same with the WASPAS and TODIM methods, and similar rankings are obtained in sensitivity analyses where the criteria weights are changed.

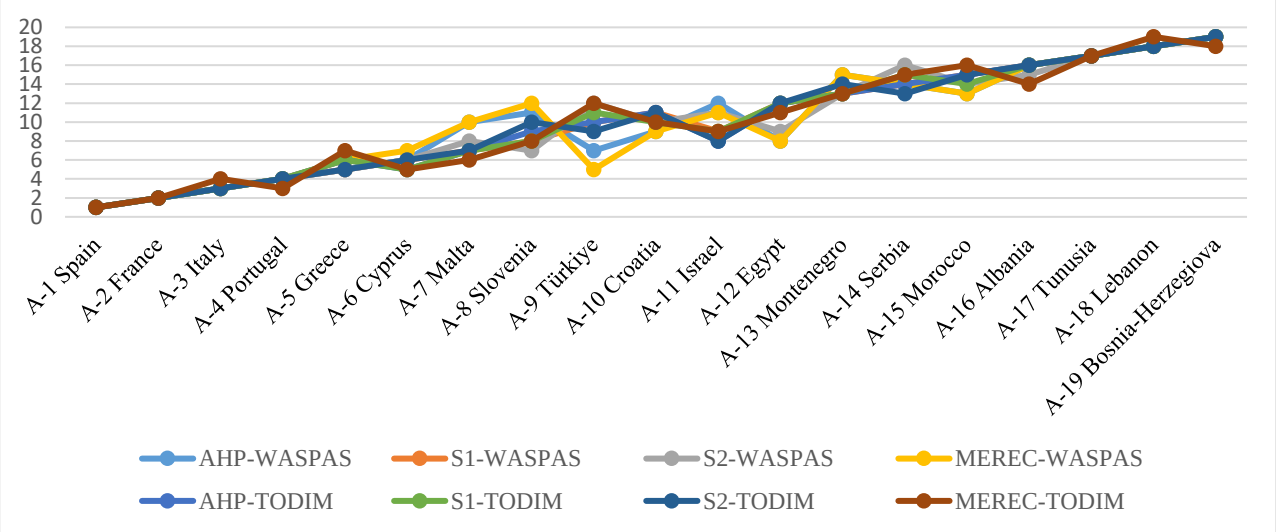

Figure 4: Findings on the Ranking of Countries with MCDM Methods

Source: Authors' own elaboration

5. Discussion and Conclusion

Tourism is being one of the largest and most dynamic industries in the world today, both in terms of the size of the available market and the economic opportunities it offers. As a result, many companies, regions and governments want to better understand and develop tourism and maximize its economic benefits. The way to achieve this is to understand tourism today while making accurate forecasts for the future. Countries that want to get a share of the tourism pie can have a say both by improving their weak criteria that affect competition and by maintaining their strengths.

In this study, it is aimed to examine the tourism development levels of 19 countries bordering the Mediterranean Sea by using the criteria and sub-criteria of the TTDI published by the WEF and the index data with MCDM methods. For the purpose of the study, the importance weights of the criteria were first calculated with the AHP method using the index criteria developed by WEF, and then the countries were ranked with the WASPAS and TODIM methods. At the end of the research, the results obtained from both approaches were compared by correlation analysis. The order of importance of the expert opinions obtained with the AHP method is Environmental Conditions, Travel and Tourism Demand Drivers, Travel and Tourism Policies and Conditions, Infrastructure and Sustainability of Travel and Tourism. The importance level of the safety and security criterion under the environmental conditions sub-criteria coincides with the study of Manap Davras (2020) for 2019 data, and the importance level of the health and hygiene criterion coincides with the study of Martinez-Gonzales et al. (2021) for 2019 data. In the light of this information, it is concluded that health and hygiene and safety and security conditions are criteria that have a high impact on competition according to expert opinions. On the other hand, sensitivity analysis was applied to examine the possible differences between the rankings under conditions where the importance weights of the criteria were changed. Türkiye, which is ranked 9th in the WEF's ranking, is ranked 8th in the AHP-based WASPAS method. As a result of the sensitivity analysis, it is seen that in Scenario 1, where the criteria weights are kept equal, Turkey ranks 10^{th}, while in Scenario 2, where the highest and lowest importance weights are switched, Turkey ranks 11^{th}. This situation can be explained as follows; Türkiye will be able to maintain its ranking and find a place in higher ranks if it maintains its airline transportation facilities and further develops its information technology infrastructure.

When the travel and tourism development index is analyzed, it is seen that Türkiye ranks 45^{th} globally and 9^{th} in the ranking of the index in the Mediterranean region, while it ranks 7^{th} in the WASPAS method ranking and 10^{th} in the TODIM method ranking. When the scores for the criteria included in the index data are analyzed, it is seen that the score for "Natural Resources" is 2.8, "Openness to the World" is 3.4, "Travel and Tourism Demand Pressure and Impact" is 3.5, "Environmental Sustainability" is 3.6, "Socioeconomic Conditions" is 3.7, "Business Environment" is 3.8 and these criteria are below the average score of 4. Türkiye's above average criteria are "Price Competitiveness", 6, "Information Technology Infrastructure", 5.2, "Land and Port Infrastructure", 4, "Safety and Security", 4.8, "Health and Hygiene", 4.8, "Human Resources and Labor Market" 4.4, "Priority of Travel and Tourism" 4.4, "Airline Transportation Infrastructure" 5.0, "Touristic Service Infrastructure" 4.2, "Cultural Resources" 4.4, "Non Leisure Resources" 4.1. It is recommended for policy makers to strengthen Türkiye's criteria that are below the average score of 4 and to protect and improve the strong criteria and to develop more sustainable policies to increase competitiveness.

This research makes an important contribution to the literature by comparing the WEF TTDI rankings with the AHP-based TODIM and WASPAS rankings. Such a comparison provides an in-depth perspective on the limitations of existing indices and their implications for policy development. The AHP-based TODIM and WASPAS methods used in this study offer an approach that goes beyond traditional methods in analyzing the level of development of the travel and tourism industry. While there are studies in the literature, usually using WEF or similar indices (Rodrigues-Diaz & Pulido-Fernandez, 2020; Martinez-Gonzalez *et al.*, 2021; Sakal, 2021; Babat *et al.*, 2023), the adaptation of MCDM methods to the industry is a new methodological contribution in this field. It can be emphasized that the AHP-based TODIM and WASPAS methods offer decision makers a more dynamic, flexible and multidimensional decision support, thus providing a more detailed and comprehensive competitiveness analysis.

Practical Suggestion

In this study, by revealing the differences in the rankings between the WEF Index and the MCDM-based methods, the current indices are found to be inadequate and suggestions are presented on how alternative methods can overcome these deficiencies. Accordingly, methodological changes can be suggested to make the indices more transparent, more inclusive and more reliable. Furthermore, it can be concluded that other MCDM methods such as AHP should be integrated more broadly into travel and tourism competitiveness and development indices. This research reveals that the use of MCDM methods, rather than just existing index rankings, will allow for more realistic shaping of travel and tourism strategies. With these new methods, policymakers can more accurately assess different country and regional conditions and develop more comprehensive strategies to increase competitiveness levels in the sector. For example, Türkiye's ranking from 9^{th} in the WEF rankings to 10^{th} and 7^{th} in the AHP-based TODIM and WASPAS rankings may indicate that Türkiye's competitiveness policy needs to be reshaped. This could lead to improvements in

infrastructure, digitalization, environmental sustainability and other critical factors.

Limitations and future research directions

This research also has some limitations in various aspects. The biggest limitation of the research is that the method examined was limited to the purpose of weighting the criteria and ranking the alternatives, which are the specific characteristics of the MCDM methods. In future studies, it is recommended to examine the significance levels of the differences between the criteria with methods such as difference tests. It will be possible to diversify the research results by using different objective criteria weighting methods such as ENTROPY, CRITIC, CILOS, ITARA, IDOCRIW or other subjective criteria weighting methods such as ANP, DEMATEL, FUCOM, SWARA, BWM.

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Jomat

Journal of multidisciplinary academic tourism

ISSN: 2645-9078

2025, 10 (2): 225-239

https://doi.org/10.31822/jomat.2025-10-2-225

INFO PAGE

Examination of travel and tourism development levels of the Mediterranean Countries with multicriteria decision making methods

Abstract

This study aims to examine the tourism development levels of the countries in the Mediterranean region according to the Travel and Tourism Development Index (TTDI) published by the World Economic Forum (WEF) using multi-criteria decision-making methods. For this purpose, the study compares the Travel and Tourism Development levels of the countries bordering the Mediterranean Sea according to 5 main criteria and 17 sub-criteria in the index. In this context, the importance weights of the index criteria were calculated by taking expert opinions with the AHP method and the Mediterranean countries with data in the index were ranked by TODIM and WASPAS methods. After the expert opinions, it was determined that the most important criteria were Environmental Conditions, Travel and Tourism Policies and Conditions, Travel and Tourism Demand Drivers, Infrastructure and Sustainability of Travel and Tourism. According to the results of the WASPAS method, the development levels of 8 countries differed from the WEF data, while according to the TODIM method, differences were observed in the rankings of 6 countries. In line with the results of the study, it is concluded that Mediterranean countries can maintain their ranking if they give more weight to important criteria that affect tourism development such as Environmental Conditions, Travel and Tourism Policies and Conditions and Travel and Tourism Demand Pressure.

Keywords: *Mediterranean Countries, World Economic Forum, Travel and Tourism Development Index, WASPAS, TODIM.*

Authors

Full Name	Author contribution roles	Contribution rate
Ahmet Duman:	*Conceptualism, Methodology, Software, Resources, Writing - Original Draft*	*50%*
Saniye Gül Güneş:	*Writing - Review & Editing, Supervision, Project administration*	*50%*

Author statement: *Author(s) declare(s) that All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.* ***Declaration of Conflicting Interests:*** *The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article*

Ethics Committee Satatement: Ethics committee report is available for this research and it has been documented to the journal

Ethics committee: Selcuk University Faculty of Tourism Ethics Commitee

Date of ethics committee decision: 04.09.2023

Ethics committee decision number: 180