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## LEISURE & TOURISM | RESEARCH ARTICLE

# Determination of tourism activities of the world's best tourism destinations using the multi-criteria decision-making method

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**Abstract:** In this study, the tourism performance of the 15 countries that are the most popular global tourist destinations are analyzed using the TOPSIS method. Four factors are employed to measure the tourism activities in these countries: international tourism expenditures, international tourism receipts, number of international tourism arrivals and number of international tourism departures. The TOPSIS method is applied to combine the four factors and convert them into a single performance score. The countries are then ranked and rated. Tourism activities are used to grade the countries' performance scores. In this way, the valuation of tourism activities in the 15 countries is determined for the 6 years between 2009 and 2014. The results are compared with the results of international tourism organizations.

**Subjects:** Social Sciences; Tourism, Hospitality and Events; Economics, Finance, Business & Industry

**Keywords:** tourism industry; tourism activities; TOPSIS method

### 1. Introduction

International tourism, which is the third largest economic sector (surpassed only by the petrochemical and automotive sectors), has grown rapidly over the past half century. Currently, tourism accounts for 9.5% of the global economy and 4.4% of all investment globally. Furthermore, 5.4% of world exports are based on tourism, which indicates the importance of tourism to the global economy (World Travel & Tourism Council, 2014). According to a study conducted by the World Tourism Organization (UNWTO), by 2020, 1.4 billion people will be involved in international tourism, and by



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Mehmet Oğuzhan Ilban received his Master's Degree (2002) in Tourism Management and he obtained a PhD Degree (2007) from the University of Balıkesir in Turkey. Currently, Mr Mehmet Oğuzhan Ilban is an associate professor in the High School of Applied Sciences at the University of Balıkesir. Mr Ilban has extensive experience in the tourism and hotel industry. His main research interests include tourism education, tourism marketing and hotel management.

### PUBLIC INTEREST STATEMENT

Today's tourism sector has high competition like other sectors. Incomes from the tourism sector contributes to the economic size of the countries with tourism potential. Countries are graded to describe the situation of World tourism in some reports and outlook. As a result of this rating and ranking, the countries are ranked from the best to the worst as according to the tourism activity status. In this study, the countries are ranked according to the status of tourism activity using the TOPSIS method of multi criteria decision making methods. With the results of such alternative models being used, a more sound evaluation can be made by comparing the annual results of the institutions that are rating the tourism activities of the countries on annual basis and in reports.

2030, this figure is expected to reach 1.8 billion people (WTTC, 2014). Figures from the UNWTO show that tourist arrivals reached 1.087 billion people in 2013, up from 25 million people in 1950. The amount of trade from tourism in the international arena is \$1.159 trillion.

Between 1980 and 1995, the increase in the number of tourists throughout the world was 4.4%, and between 1995 and 2010, the increase was 3.9% despite numerous wars, terrorist activities and global crises that affected every almost location in the world. Tourism was among the few sectors that were not seriously affected by these factors. In 2013, the number of tourists travelling to other countries reached 1.087 billion people.

The global tourism market has undergone a significant quality change in recent years. Tourism activities have been diversified, tourism expenditures (per person) have increased rapidly compared to the past, new regions have been opened to international tourism, and traditional regions have made a great effort to innovate and be competitive. Many countries have attempted to improve their accessible tourism products and recreational activities to meet the ever-changing demand for tourism.

The dispersion of tourism activities throughout the world indicates that Europe and North America account for the largest share of global tourism activities. The largest suppliers in the global tourism and travel sectors are the European Union (EU) countries. Tourism activities toward developing countries have increased rapidly as an effect of the globalization process. Through globalization, the minimizing of border formalities between countries, greater democratic policies in transportation facilities, quality and prices, the harmonization of information and communication technologies to all service sectors including tourism, and publicity and advertising, potential tourists have been informed of the supply sources of many new destinations throughout the world. Developing countries have increased their share of the tourism market in recent years. The 15 countries in this study account for approximately 70% of total global tourism activities. However, the ranking for these 15 countries (WTO, etc.) is a ranking that is revealed by taking the basic input variables in tourism separately. We can say that the tourism performances of the countries are very important both for the investors and for the potential tourists. In this respect, it will be more realistic and useful to determine more than one variable at the same time in order to create these rankings which will affect competition, investments and tourists' preferences.

This study for this proposes the TOPSIS approaches together for evaluating the ranking and rating of best of world 15 tourism destinations. Criteria can be quantitative, such as number of international inbound and outbound tourists, international tourism receipts and expenditures. Therefore, this study aims to determine whether (1) these four criteria affect the tourism destination's performance and (2) these four criteria affect the ranking destinations. The result of evaluation may help strategy makers of tourism sector, governments, investors and entrepreneurs, management of tour agencies, international tourists/traveler and academicians in tourism industries etc.

## 2. Assessment criteria for tourism activities

There are three key drivers of the tourism sector: international tourism expenditures, international tourism receipts and the number of international tourist arrivals in countries (Zaman, Shahbaz, Loganathan, & Raza, 2016, p. 276). However, international outbound tourists are the most important factor to enhance a country's competitive advantage (Hong, 2009, p. 125). The definitions of these assessment values are provided below (data.worldbank.org: The World Bank, 2016):

*International tourism expenditures* are expenditures by international outbound visitors in other countries, including payments to foreign carriers for international transport. These expenditures may include those by residents traveling abroad as same-day visitors, except in cases where these are important enough to justify separate classification.

*International tourism receipts* are expenditures by international inbound visitors, including payments to national carriers for international transport. These receipts include any other prepayment for goods or services received in the destination country. They may also include receipts from same-day visitors, except when these are important enough to justify separate classification.

*International inbound tourists* (overnight visitors) are tourists who travel to a country other than the country of their usual residence outside their usual environment for a period not exceeding 12 months and whose main purpose in visiting is an activity other than one remunerated from within the country visited.

*International outbound tourists* includes the departures that people make from their country of residence to any other country for any purpose other than a remunerated activity in the country visited.

Each of these assessment criteria is of great significance (Hong, 2009; Lim, 1997; Zaman et al., 2016). International tourism receipts seem to be the only criterion for assessing tourism incomes to the economy of a country, but this is not the case. The number of inbound tourists to a country, for example, is also very important in the advertising of that country and can attract more tourists in the future. Tourism is a good example of a sector in which tourists share their opinions both offline and online. Interpersonal influence is important because of its intangible nature and the fact that it cannot be evaluated before purchasing (Litvin, Goldsmith, & Pan, 2008; Phillips, Wolfe, Hodur, & Leistriz, 2013). Expenditures as a result of tourism activities are not only relevant to countries' development levels but also provide important clues about the frequency of the participation of the citizens of a country in tourism activities (Latham & Edwards, 2003, p. 61). However, these expenditures are also very important assessment criteria for improving concepts such as customer satisfaction and quality service, which are used as data in this study. Thus, all of these factors are significant criteria for countries' tourism performance (Dwyer & Forsyth, 2007, pp. 46–54). This study considers these criteria equally in the assessment of tourism activities. The tourism performance of 15 countries that have attractive destinations on a global scale are assessed accordingly.

### 3. Literature review

Charnes, Cooper, and Rhodes (1978) focused on the importance of using different calculation techniques for the financial assessment of companies. Deng, Yeh, and Willis (2000) determined that the technique for order preference by similarity to an ideal solution (TOPSIS) method is a simple and efficient way to measure and evaluate the internal performance of companies by using financial rates. The financial rates used in China in the assessment of companies provide meaningful and helpful data about countries and play an important role in the decision-making process. In their study, which aimed to examine the performance of airline companies, Feng and Wang (2000) employed the TOPSIS method by using 22 variables as transportation and financial indicators for five Taiwanese airline companies and concluded that these indicators are effective in the assessment of these companies.

In their study of the selection of the best offer in bids made in a manufacturing company, Hao and Qing-sheng (2006) used the TOPSIS method to determine the best tender offer from 4 competing companies for certain electronic devices and considered 12 indicators. Shih, Shyur, and Lee (2007) also used the TOPSIS method in the personnel selection process for the human resources department of a local chemistry company and demonstrated that the method is a strong one.

Luo, Wang, Wu, and Wu (2008) conducted a study of coordination between urban tourism and urban development in Hangzhou by applying the TOPSIS method. Based on an in-depth analysis of the present literature on urban tourism, the paper introduced a coordinative evaluation index system of urban tourism and urban development, calculated the coordinative index in Hangzhou and determined the rank of the coordinative state. The study results indicated that the coordinative index between urban tourism and urban development increases with each passing year. As time

passes, the coordinative index value gradually approaches an optimum, which was 0.8631 in 2005. With the maturity of urbanization and tourism development, the coordinative state gradually becomes optimized. The coordinative state in Hangzhou shifted from relative non-coordination in 2001 to high coordination in 2005.

Eleren and Karagül (2008) evaluated the performance of the Turkish economy, which benefitted from 7 basic indicators between the years 1986 and 2006. Using a single performance point for each year with the TOPSIS method, they found that 1986 was the year with the best economic performance and that 1999 was the worst.

Karimi, Yusop, and Hook (2010) examined the location decision for foreign direct investment in ASEAN countries using the TOPSIS approach, which provides a relatively simple tool for this strategic decision-making problem. By using the TOPSIS method, the capacity and attraction of ASEAN countries is evaluated and given a final rank for the 2000–2005 period. Within the model, ten indicators are defined as determinants of FDI inflows. Their empirical results indicate that Singapore is the most attractive for investment among ASEAN countries, although the ranking of some countries changed during those years.

Demireli (2010) attempted to determine the performance of the state-owned banks in Turkey by using the TOPSIS method. He discovered that the banks that had a nationwide operation network were influenced by the regional and global crises between 2001 and 2007. Their performance points fluctuated continually based on international data, and the banking sector could not record any striking improvement in the given period.

Yükçü and Atağan (2010) attempted to measure which company showed the best performance by using the TOPSIS method with the performance indicators of three companies in the sector and under the same holding. They ordered these three companies in terms of holding after analyzing the companies' performance. They concluded that the TOPSIS method allows the decision-maker to make a more objective evaluation because the method combines different evaluation options into a single criterion.

Zhang and Zhang (2010) studied the regional competitiveness of the tourism resources of 16 cities in the Yangtze River Delta. Their analysis indicates that there are significant differences among the 16 cities in terms of tourism resource competitiveness. Suzhou and Hangzhou are the most competitive, whereas Taizhou and Nantong are the least competitive. Their conclusion suggests that the weighted TOPSIS method can be applied to a comparative analysis of the regional competitiveness of tourism resources and can both reduce the subjective influence and improve the reliability of the evaluation results.

Mangir and Erdogan (2011) aimed to analyze the determinants of the worldwide financial crisis and recession. In particular, they used the TOPSIS method to focus on the following countries where the effects of the global financial crisis were severe: Italy, Greece, Spanish, Portugal, Ireland and Turkey. The evaluation criteria and sub-criteria used to evaluate the macroeconomic performance were defined as follows: Economic Growth (EG), Inflation rate (IR), Unemployment rate (UR), Current Account Balance (CAB), and Budget Balance rate (BB). They found that all of the countries were affected by the crisis in 2008 but that Turkey was the country that felt the least impact.

Shamai and Mosivand (2011) studied the factors that attract tourists to a destination and determined the hierarchy of towns in Isfahan (Iran) based on these factors. The factors assessed for each town included hotels, motels, suburban units, restaurants, tour and travel agencies, travel service offices, transportation companies, art galleries and cultural exhibitions, public parks, number of public transport systems, special tourism areas, and capitalization opportunities. The TOPSIS model was used to create a hierarchy of tourism substructures, and the AHP approach was used for the final

ranking. Isfahan ranked first, with Kashan and ShahinShahr in second and third place, respectively. The authors also presented suggestions for tourism development.

Mohamad and Jamil (2012) evaluated the critical factors that influence local tourists' choice of destinations in Kedah and determined tourists' preference for the destinations with respect to these factors using the Fuzzy Hierarchical TOPSIS (FHTOPSIS) method. This study focused on the internal factors that motivate tourists to choose their destination. Their results show that visiting friends and relatives is the most important factor that motivates visits to Kedah, whereas novelty seeking is the least motivating factor that influences the choice of destination. The best destination among the five destinations under consideration in their study was Langkawi, followed by AlorSetar, Sedim River, Bujang Valley and Bukit KayuHitam. This study can help relevant authorities and travel agencies plan and promote attractions in Kedah by using effective marketing strategies and can help tourists decide which main attractions in Kedah to visit.

Huang and Peng (2012) analyzed the Tourism Destination Competitiveness (TDC) of nine Asian countries: China, Hong Kong, Japan, Korea, Malaysia, Singapore, Taiwan, Thailand and the Philippines. The study was conducted in 2009 and used 6 criteria and 15 indices. The results in 2009 indicated that the Asian countries ranked from most to least competitive as follows: China, Japan, Hong Kong, Malaysia, Thailand, Singapore, Taiwan, Korea and the Philippines.

Supçiler and Çapraz (2011) focused on the problem of supplier selection in their study. They selected the most appropriate supplier by using both the TOPSIS method and the multi-criteria decision-making method. They selected the best supplier with the highest score among the present suppliers, which was the one that would provide the maximum benefit to the company. The main criteria they used in the selection of the supplier were quality, cost, delivery and service.

Uygurtürk and Korkmaz (2012) analyzed the financial performance of the 13 main metal industry companies in Borsa, Istanbul, using the financial tables of the companies from 2006 to 2010 with the TOPSIS method. They converted the general company performance of the companies into a single point by means of the TOPSIS method and used this point to rank the companies from best to worst. They found that the performance points of the companies in the metal sector generally changed during the analysis periods.

Önder, Yıldırım, and Özdemir (2013) studied the competitiveness of the Turkey tourism destinations by using the Analytical Hierarchy Process (AHP) and TOPSIS method. The study was conducted two main criteria with qualitative and quantitative and used 31 attributes and 13 region. The results indicated that the Turkey tourist regions ranked from most to least competitive as follows: Alanya, Bodrum, Çeşme, Didim, Fethiye etc.

Urfalıoğlu and Genç (2013) used the TOPSIS method to determine the economic situation of Turkey in the EU process. The decision criteria in the study were gross national product per capita, the rate of growth, export, import, employment and inflation, which were applied to the 27 full member countries and 5 candidate countries of the EU (Turkey, Macedonia, Iceland, Croatia and Montenegro). They compared the results obtained using the TOPSIS method with those obtained using other decision-making methods and noted very close findings to other multi-criteria decision-making methods.

#### 4. Research method

A general overview of all tourism activities shows that there are 15 important destinations in the world. These destinations account for 70% of global tourism activities. Four main factors are included in the analysis from 2009 to 2014 to visualize the comparative performance of the 15 important destinations. Information for these 6 years about tourism expenditures, tourism receipts, inbound tourists and outbound tourists is taken from the annual UNWTO, Tourism Highlights and

**Table 1. The countries included in the study**

Number	Country code	Name
1	AUT	Austria
2	CAN	Canada
3	CHN	China
4	DEU	Germany
5	ESP	Spain
6	FRA	France
7	GBR	United Kingdom
8	GRC	Greece
9	HUN	Hungary
10	ITA	Italy
11	MEX	Mexico
12	POL	Poland
13	RUS	Russian federation
14	TUR	Turkey
15	USA	The United States

World Bank Tourism Data. The information and codes of the 15 countries used as important destinations for the analysis are presented in Table 1.

The analysis of the study consists of two steps. In the first step, four pieces of tourism data are determined to define the tourism performance of the destinations. Then, data for the period from 2009 to 2014 are compiled for each of the 15 countries. In the second step, the TOPSIS method converts the general tourism performance of the countries into a single point. Finally, the destination rating is completed, and the countries are ordered according to their points from largest to smallest. Table 2 shows a list of the codes of the tourism activities used in the study.

In general, only the top 10 countries are given for each criterion in the ratings. The study was applied to the years from 2009 to 2014, and the top 10 countries differed in each of the six years. For this reason, considering the change in countries, the four assessment criteria are employed for the 15 countries with regard to the results for the mentioned years.

This study uses the TOPSIS method, one of the most common decision-making methods, to analyze the performance of the 15 most popular countries in the world and to rate their tourism activities. These countries account for 70% of all tourism activities.

### 5. TOPSIS method

The decision problem involves the process of determining the best option among the most appropriate options. There are a wide variety of methods, such as TOPSIS, ELECTRA, AHP, Fuzzy AHP, and Fuzzy TOPSIS, to make decisions in the face of multivariate decision-making problems. In recent years, a multi-purpose, commonly used method, the TOPSIS method, which is based on multiple criteria evaluation and decision makers, has been used successfully.

**Table 2. Tourism activities and codes**

No	KOD	Rates
1	EXP	International tourism expenditures (\$)
2	REC	International tourism receipts (\$)
3	ARR	International tourism, number of arrivals
4	DEP	International tourism, number of departures



The TOPSIS method was presented by Chen and Hwang (1992), with reference to Hwang and Yoon (1981). TOPSIS is a multiple criteria method for identifying solutions from a finite set of alternatives. The basic principle is that the chosen alternative should have the shortest distance from the positive ideal solution and the farthest distance from the negative ideal solution. The TOPSIS procedure can be expressed in a series of steps.

**Step 1: Creating a decision matrix (A)**

Decisions related to the listed advantages of the line matrix occur with the desired decision points. The decision matrix is located in the columns of the assessment factors to be used in decision-making. The initial matrix is formed by decision makers. The decision matrix is shown as follows:

$$A_{ij} = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{bmatrix},$$

where “m” is the number of decision points in the  $A_{ij}$  matrix and “n” represents the number of evaluation factors.

**Step 2: Create a standard decision matrix (R).**

$$r_{ij} = x_{ij} \sqrt{\sum_{i=1}^m x_{ij}^2}, i = 1, 2, \dots, m \text{ and } j = 1, 2, \dots, n. \tag{1}$$

Matrix R is obtained as shown on  $R_{ij} = \begin{bmatrix} r_{11} & r_{12} & \dots & r_{1n} \\ r_{21} & r_{22} & \dots & r_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ r_{m1} & r_{m2} & \dots & r_{mn} \end{bmatrix}.$

**Step 3: Calculate the weighted normalized decision matrix (V).**

The weighted normalized value  $v_{ij}$  is calculated as follows:

$$v_{ij} = r_{ij} \times w_j, i = 1, 2, \dots, m \text{ and } j = 1, 2, \dots, n,$$

where  $w_j$  is the weight of the  $j$ th criterion or attribute and  $\sum_{j=1}^n w_j = 1.$

$$V_{ij} = \begin{bmatrix} w_1 r_{11} & w_2 r_{12} & \dots & w_n r_{1n} \\ w_1 r_{21} & w_2 r_{22} & \dots & w_n r_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ w_1 r_{m1} & w_2 r_{m2} & \dots & w_n r_{mn} \end{bmatrix}.$$

**Step 4: Determine the ideal (A\*) and negative ideal (A-) solutions.**

$$A^* = \{(\max_j v_{ij} | j \in C_b), (\min_j v_{ij} | j \in C_c)\} = \{v_j^* | j = 1, 2, \dots, m\} \tag{2}$$

$$A^- = \{(\min_j v_{ij} | j \in C_b), (\max_j v_{ij} | j \in C_c)\} = \{v_j^- | j = 1, 2, \dots, m\} \tag{3}$$

**Step 5: Calculate the separation measures using the m-dimensional Euclidean distance.**

The separation measures of each alternative from the positive ideal solution and the negative ideal solution, respectively, are as follows:

$$S_i^* = \sqrt{\sum_{j=1}^m (v_{ij} - v_j^*)^2}, j = 1, 2, \dots, m \tag{4}$$

$$S_i^- = \sqrt{\sum_{j=1}^m (v_{ij} - v_j^-)^2}, j = 1, 2, \dots, m \tag{5}$$

**Step 6: Calculate the relative closeness to the ideal solution.**

The relative closeness of the alternative  $A_i$  with respect to  $A^*$  is defined as follows:

$$C_i^* = \frac{S_i^-}{S_i^* + S_i^-}, i = 1, 2, \dots, m \tag{6}$$

Rank the preference order, and then find the values of the order of magnitude sequenced in order of importance that are determined by the decision point.

**6. Results of the study**

Fifteen countries with tourism destinations are analyzed in this study. The codes of these 15 countries are AUT, CAN, CHN, DEU, ESP, FRA, GBR, GRC, HUN, ITA, MEX, POL, RUS, TUR and USA. To see the destination performance of these countries, the tourism activity criterion is used for the years from 2009 to 2014.

The study is composed of two steps. In the first step of the analysis, 4 pieces of tourism data are determined to define the tourism performance of the countries. Then, the data are calculated for each of the 15 countries for the years from 2009 to 2014 according to these criteria. In the second step, the four factors chosen to determine the performance of these attractive tourism destinations are used to calculate a single tourism performance score for each country by means of TOPSIS. The countries are ordered according to this score. After calculating the general score of each country individually for 2009–2014, the countries are rated for the study. The Excel program is used to apply the TOPSIS method.

The first step in the TOPSIS method is to make a Decision Matrix (A). The rows of the Decision Matrix contain decision points that can be used to rank the superiority of the countries, and the columns contain evaluation criteria that should be used for decision-making. Matrix A is the beginning matrix for the decision-maker. The matrix for 2009 is given as a sample. The other matrixes are not given here because they include the same application.

**Table 3. Decision-making matrix for 2009**

Number	Country code	EXP (\$)	REC (\$)	ARR	DEP
1	AUT	12.767.000.000	21.220.000.000	21.355.000	10.121.000
2	CAN	30.065.000.000	15.568.000.000	15.737.000	26.204.000
3	CHN	47.108.000.000	42.632.000.000	50.875.000	47.656.000
4	DEU	92.829.000.000	47.462.000.000	24.220.000	72.300.000
5	ESP	22.787.000.000	59.743.000.000	52.178.000	12.017.000
6	FRA	45.806.000.000	58.857.000.000	76.764.000	25.140.000
7	GBR	61.133.000.000	38.564.000.000	28.199.000	58.614.000
8	GRC	3.401.000.000	14.796.000.000	14.915.000	3.835.000
9	HUN	3.251.000.000	7.013.000.000	9.058.000	16.640.000
10	ITA	34.399.000.000	41.938.000.000	43.239.000	29.060.000
11	MEX	8.737.000.000	12.542.000.000	22.346.000	14.104.000
12	POL	7.888.000.000	9.843.000.000	11.890.000	39.270.000
13	RUS	23.785.000.000	12.369.000.000	21.339.000	34.276.000
14	TUR	5.061.000.000	26.331.000.000	30.187.000	5.561.000
15	USA	102.953.000.000	146.002.000.000	55.103.000	62.051.000



**Step 1: Forming matrix A:** There are 15 decision points (alternatives/destinations) and 4 assessment factors (criteria/tourism evaluation criteria) in the study. First, a standard decision-making matrix is created with the dimensions (15 × 4). Based on this matrix, the decision matrix of the 15 countries is presented in Table 3.

**Step 2: Forming the standard decision matrix (R):** The normalized decision matrix is calculated by using the elements of Matrix A and Equation (1) (Table 4).

**Step 3: forming weighted standard decision matrix (V):** In this step, weight rates ( $W_i$ ) are calculated for the assessment factors. Then, the standard values are calculated by multiplying the normalized standard values, calculated above, by the ( $W_i$ ) values to determine the weighted standard values. The assessment factors are weighted equally in decision-making for 2009. When all of the factors are valued 1 equally for dispersion, the weighted assessment value is 25% for each factor. To create the weighted standard decision matrix, the columns of Matrix V are calculated by multiplying the values in the columns of Matrix R by the weight values of the assessment factors (here, all are 25%). Table 5 presents the weighted standard decision matrix of the countries together with the solution sets ideal  $A^+$  and ideal  $A^-$ .

**Step 4: Forming the analysis of ideal ( $A^+$ ) and negative ideal ( $A^-$ ):** In this step, solution sets of ideal  $A^+$  and negative ideal  $A^-$  are formed. For set  $A^+$ , the largest value in each column of Matrix V and the smallest for set  $A^-$  in the same column are selected, and the sets are arranged according to the appropriateness of the criteria to the goal:

$$A^+ = \left\{ (\max_i v_{ij} | j \in J), (\min_i v_{ij} | j \in J') \right\}$$

$$A^- = \left\{ (\min_i v_{ij} | j \in J), (\max_i v_{ij} | j \in J') \right\}.$$

According to the formula,

$$A^+ = \{0.1466; 0.1817; 0.1340; 0.1264\}$$

$$A^- = \{0.0046; 0.0090; 0.0158; 0.0067\}$$

**Table 4. Standard decision matrix for 2009**

Number	Country code	EXP	REC	ARR	DEP
1	AUT	0.07275	0.1092	0.1491	0.0708
2	CAN	0.17133	0.0800	0.1098	0.1833
3	CHN	0.26845	0.2180	0.3552	0.3333
4	DEU	0.52900	0.2425	0.1691	0.5057
5	ESP	0.12985	0.3041	0.3643	0.0840
6	FRA	0.26103	0.2993	0.5360	0.1758
7	GBR	0.34837	0.1951	0.1969	0.4100
8	GRC	0.01938	0.0763	0.1041	0.0268
9	HUN	0.01852	0.0362	0.0632	0.1164
10	ITA	0.19603	0.2148	0.3019	0.2032
11	MEX	0.04978	0.0647	0.1560	0.0986
12	POL	0.04495	0.0508	0.0830	0.2747
13	RUS	0.13554	0.0638	0.1490	0.2397
14	TUR	0.02884	0.1354	0.2108	0.0389
15	USA	0.58669	0.7270	0.3847	0.4340

**Table 5. Weighted standard decision matrix for 2009**

Number	Country code	EXP	REC	ARR	DEP
1	AUT	0.0181	0.0273	0.0372	0.0177
2	CAN	0.0428	0.0200	0.0274	0.0458
3	CHN	0.0671	0.0545	0.0888	0.0833
4	DEU	0.1322	0.0606	0.0422	0.1264
5	ESP	0.0324	0.0760	0.0910	0.0210
6	FRA	0.0652	0.0748	0.1340	0.0439
7	GBR	0.0870	0.0487	0.0492	0.1025
8	GRC	0.0048	0.0190	0.0260	0.0067
9	HUN	0.0046	0.0090	0.0158	0.0291
10	ITA	0.0490	0.0537	0.0754	0.0508
11	MEX	0.0124	0.0161	0.0390	0.0246
12	POL	0.0112	0.0127	0.0207	0.0686
13	RUS	0.0338	0.0159	0.0372	0.0599
14	TUR	0.0072	0.0338	0.0527	0.0097
15	USA	0.1466	0.1817	0.0961	0.1085
	MAX (A <sup>+</sup> )	0.1466	0.1817	0.1340	0.1264
	MIN (A <sup>-</sup> )	0.0046	0.0090	0.0158	0.0067

**Step 5: Calculation of the selection criteria:** The spaces between alternatives are found by means of the Euclidean distance with dimension n. The distance of each alternative from both the positive ideal solution ( $S_i^*$ ) and the negative ideal solution ( $S_i^-$ ) is calculated using Formulas (4) and (5).

$$S_i^* = \{0.2480; 0.2340; 0.1625; 0.1526; 0.1928; 0.1576; 0.1702; 0.2693; 0.2710; 0.1873; 0.2545; 0.2511; 0.2323; 0.2481; 0.0418\}$$

$$S_i^- = \{0.0331; 0.0569; 0.1310; 0.1843; 0.1055; 0.1528; 0.1366; 0.0143; 0.0223; 0.0973; 0.0311; 0.0626; 0.0647; 0.0446; 0.2585\}.$$

**Step 6: Calculation of proximity according to ideal solution:** In the calculation of relative proximity ( $C_i^*$ ) of the ideal solution to each decision point, the ideal and negative ideal distinction scores are used. The calculation of the proximity value relative to the ideal solution is indicated in Formula (6).

$C_i^*$  is normally valued between  $0 \leq C_i^* \leq 1$  for 2009. The equation  $C_i^* = 1$  indicates proximity to the ideal solution, and  $C_i^* = 0$  indicates absolute proximity to the negative ideal solution. Table 6 shows the calculation of the relative proximity of the countries to the ideal solution for the year 2009.

In this step, the  $C_i^*$  values are arranged according to how large they are, and an order of decision points (alternatives) is made. The scores are arranged from largest to smallest to indicate which country is more attractive.

The order of scores for each destination is given in Table 7, which indicates that the country with code USA (United States of America) realized the best performance, whereas the country with code GRC (Greece) had the worst performance based on the four criteria chosen among the assessment factors from the destination performances for 2009. According to Table 7, the order of the destinations according to their 2009 performance is as follows: USA(1), DEU(2), FRA(3), CHN(4), GBR(5), ESP(6), ITA(7), RUS(8), POL(9), CAN(10), TUR(11), AUT(12), MEX(13), HUN(14), and GRC(15).

**Table 6. Relative proximity values to ideal solution in 2009**

Country code	C*
AUT	$0.0331/(0.0331 + 0.2480) = 0.1178$
CAN	$0.0569/(0.0569 + 0.2340) = 0.1950$
CHN	$0.1310/(0.1310 + 0.1625) = 0.4463$
DEU	$0.1843/(0.1843 + 0.1526) = 0.5470$
ESP	$0.1055/(0.1055 + 0.1928) = 0.3536$
FRA	$0.1528/(0.1528 + 0.1576) = 0.4921$
GBR	$0.1366/(0.1366 + 0.1702) = 0.4452$
GRC	$0.0143/(0.0143 + 0.2693) = 0.0504$
HUN	$0.0223/(0.0223 + 0.2710) = 0.0763$
ITA	$0.0973/(0.0973 + 0.1873) = 0.3418$
MEX	$0.0311/(0.0311 + 0.2545) = 0.1091$
POL	$0.0626/(0.0626 + 0.2511) = 0.1995$
RUS	$0.0647/(0.0647 + 0.2323) = 0.2180$
TUR	$0.0446/(0.0446 + 0.2481) = 0.1524$
USA	$0.2585/(0.2585 + 0.0418) = 0.8606$

**Table 7. Scores and order of destinations**

2009		
Order	Country code	Scores
1	USA	0.860671
2	DEU	0.547057
3	FRA	0.492196
4	CHN	0.446348
5	GBR	0.445202
6	ESP	0.353655
7	ITA	0.341890
8	RUS	0.218031
9	POL	0.199582
10	CAN	0.195728
11	TUR	0.152433
12	AUT	0.117846
13	MEX	0.109127
14	HUN	0.076328
15	GRC	0.050471

The analysis for 2009 is repeated for 2010, 2011, 2012, 2013, and 2014, and the findings are given in Table 8. Table 8 presents the results of the ratings of the 15 destinations for each year separately, calculating the tourism activity performance scores of each country from 2009 to 2014.

## 7. Conclusions

Fifteen important destinations are included in the analysis of this study. These are coded as AUT, CAN, CHN, DEU, ESP, FRA, GBR, GRC, HUN, ITA, MEX, POL, RUS, TUR and USA. The activity reports of these countries are used to analyze the performance of these countries. The study considers four tourism activities as criteria: international tourism expenditures, international tourism receipts, the number of inbound tourists and the number of outbound tourists.

**Table 8. The performance of 15 important global destinations from 2009 to 2014**

2009			2010			2011		
Rating	Codes	Scores	Rating	Codes	Scores	Rating	Codes	Scores
1	USA	0.8607	1	USA	0.8668	1	USA	0.8353
2	DEU	0.5471	2	DEU	0.5293	2	DEU	0.5292
3	FRA	0.4922	3	CHN	0.4876	3	CHN	0.5219
4	CHN	0.4463	4	FRA	0.4517	4	FRA	0.4617
5	GBR	0.4452	5	GBR	0.4106	5	GBR	0.3973
6	ESP	0.3537	6	ESP	0.3252	6	ESP	0.3296
7	ITA	0.3419	7	ITA	0.3099	7	ITA	0.3042
8	RUS	0.2180	8	RUS	0.2374	8	RUS	0.2541
9	POL	0.1996	9	CAN	0.2142	9	CAN	0.2111
10	CAN	0.1957	10	POL	0.2028	10	POL	0.1903
11	TUR	0.1524	11	TUR	0.1459	11	TUR	0.1529
12	AUT	0.1178	12	AUT	0.1084	12	AUT	0.1027
13	MEX	0.1091	13	MEX	0.1053	13	MEX	0.0953
14	HUN	0.0763	14	HUN	0.0679	14	HUN	0.0611
15	GRC	0.0505	15	GRC	0.0398	15	GRC	0.0443
2012			2013			2014		
Rating	Codes	Scores	Rating	Codes	Scores	Rating	Codes	Scores
1	USA	0.8614	1	USA	0.8238	1	USA	0.7631
2	CHN	0.5627	2	CHN	0.5762	2	CHN	0.6287
3	DEU	0.4912	3	DEU	0.4979	3	DEU	0.4754
4	FRA	0.4351	4	FRA	0.4213	4	FRA	0.3889
5	GBR	0.3804	5	GBR	0.3664	5	GBR	0.3485
6	ESP	0.3088	6	ESP	0.3083	6	ESP	0.3132
7	RUS	0.2835	7	RUS	0.3024	7	RUS	0.2744
8	ITA	0.2820	8	ITA	0.2702	8	ITA	0.2617
9	CAN	0.2121	9	CAN	0.1758	9	CAN	0.1719
10	TUR	0.1542	10	TUR	0.1604	10	TUR	0.1519
11	AUT	0.1034	11	AUT	0.0998	11	AUT	0.1189
12	MEX	0.0978	12	MEX	0.0960	12	MEX	0.1075
13	HUN	0.0590	13	HUN	0.0534	13	GRC	0.0632
14	POL	0.0472	14	GRC	0.0482	14	HUN	0.0519
15	GRC	0.0368	15	POL	0.0481	15	POL	0.0434

The analysis of the study comprises two steps. In the first step, the four tourism data sets are selected to define the performance of these tourism destinations. Then, the data from these 15 countries from 2009 to 2014 are collected. In the second step, to show the countries' performance more clearly, the four factors selected for the tourism destinations are converted into a single score by means of the TOPSIS method, which is one of the most common multi-criteria decision-making methods. Then, the countries are ordered according to their scores with respect to the criteria, and their ratings are completed. The ratings of the tourism destinations are made by calculating their separate general tourism performance for the six years from 2009 to 2014.

The evaluation of each destination is given in three separate tables for 2009–2014. Table 9 shows the destinations' performance that remained constant through the years, Table 10 shows those

**Table 9. The destinations whose tourism activities remained constant (2009–2014)**

	2009	2010	2011	2012	2013	2014
USA	1	1	1	1	1	1
GBR	5	5	5	5	5	5
ESP	6	6	6	6	6	6

whose performance improved through the years, and Table 11 indicates the destinations whose performance worsened.

Table 9 shows that the United States of America (USA), the United Kingdom (GBR) and Spain (ESP) were able to sustain their tourism activities in the years from 2009 to 2014. According to the above analysis, these three countries maintained their performance over these years. They protected their position in tourism activities from 2009 to 2014 in the global competition.

Table 10 indicates the change or improvement in the position of China (CHN). This destination rose to second place from fourth place in the 6 years examined. The other countries that improved their place were the Russian Federation (RUS), Canada (CAN), Turkey (TUR), Austria (AUT), Mexico (MEX) and Hungary (HUN). Greece was another destination that improved, particularly in 2013 and 2014. From its initial place at 15th in 2009, Greece moved to 14th in 2013 and 13th in 2014.

Table 11 lists the destinations whose performance worsened throughout the given years. Table 11 indicates that Germany (DEU), France (FRA) and Italy (ITA) fell one rank each in the period from 2009 to 2014. However, although these destinations are on this list with decreasing performance in the period from 2009 to 2014, they maintained an important place regarding the number of tourists they attracted and in the ranking they occupied in the competitive world of tourism. The place of Poland is also striking in this table. The tourism activities of this destination worsened since 2009. It ranked 9th in 2009 and fell gradually to 15th in 2014. However, this case is also an outstanding one: the data from the four factors indicate that all of the factors in this destination showed improvement from 2009 to 2014, but their rise was at a slower rate than that of the other countries, causing this destination to fall behind.

**Table 10. The destinations whose tourism activities improved (2009–2014)**

	2009	2010	2011	2012	2013	2014
CHN	4	3	3	2	2	2
RUS	8	8	8	7	7	7
CAN	10	9	9	9	9	9
TUR	11	11	11	10	10	10
AUT	12	12	12	11	11	11
MEX	13	13	13	12	12	12
HUN	14	14	14	13	13	14
GRC	15	15	15	15	14	13

**Table 11. The destinations whose performance worsened (2009–2014)**

	2009	2010	2011	2012	2013	2014
DEU	2	2	2	3	3	3
FRA	3	4	4	4	4	4
ITA	7	7	7	8	8	8
POL	9	10	10	14	15	15

A survey of the related literature may find some studies that have used the TOPSIS method. The distinction between those studies and this study is that the results of this study yield a wide range (15 important destinations around the world, representing 70% of global tourism) and converts tourism activities such as international tourism expenditures, international tourism receipts, and the number of both inbound and outbound tourists into a single score using the TOPSIS method. The studies conducted using TOPSIS are mainly focused on the local or regional competition of countries or organizations. Rather than local or regional tourism, this study focuses on the global dimension of tourism and considers tourism from a global aspect to consider it in its entirety.

Few studies can be found in the related literature that process factors related to tourism activities, such as international tourism expenditures, international tourism receipts, and the number of inbound and outbound tourists, using the TOPSIS method, which makes this study meaningful. Another important aspect of this study is that it uses data that are as recent as 2014.

## 8. Recommendations

In this study, all of the evaluation criteria are considered equal, and the performances of significant global tourism destinations, as represented by 15 countries, are evaluated. The study covers prevalent tourism performance assessment criteria (international tourist arrivals and international tourism receipts) and includes the number of outgoing passengers and tourism expenditures. Prevalent methods of assessment do not produce a single point. Thus, there is no clear inference for the countries' tourism performance and rankings.

The findings reveal that when the number of outgoing passengers and tourism expenditures are considered in addition to more common criteria, the tourism performances of the 15 countries differ. In terms of tourism receipts, the top five countries are USA, ESP, FRA, DEU, and CHN, whereas in terms of international tourist arrivals, the top five countries are FRA, USA, ESP, CHN, and ITA. With regard to the single performance point based on the TOPSIS method, the country rankings are as follows: USA (0.7631), CHN (0.6287), DEU (0.474), FRA (0.3889), and GBR (0.3485).

The rankings according to tourism receipts and international tourist arrivals raise important points. Computing a single performance score allows the tourism performances of the countries to be evaluated more accurately. However, more variables are required to provide meaningful results with the TOPSIS method. Because it is impossible to include at least the last 5 years' worth of data and comparative data from the same countries, international tourist arrivals and tourism receipts were considered.

The fact that the TOPSIS method does not allow the use of more criteria is an important constraint in this study. Further studies may assess additional criteria, particularly "personnel employed in the tourism sector", "number of beds in tourism facilities", and "average bed prices per person", which would provide the opportunity to evaluate more reliable results for countries' tourism performance scores.

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