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ANALYSIS OF TOURISM COMPETITIVENESS IN THE MIDDLE EAST AND NORTH AFRICA REGION BETWEEN 2019 AND 2024

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SUMMARY

This study aims to analyze the tourism competitiveness of MENA countries between 2019 and 2024, assessing the changes that occurred during this period. A descriptive and analytical approach was adopted, using tourism competitiveness indexes. As well as principal component analysis and clustering analysis, conducted with the statistical software Rstudio. The main results reveal a reorganization of the clusters: countries such as the Emirates, Qatar, and Saudi Arabia have changed groups, showing an improvement in the "enabling environment" index and a slight decline in the "infrastructure and services" index. Conversely, Algeria, Tunisia, Morocco, Egypt, and Iran have moved from cluster 2 to cluster 1, characterized by high scores in the "travel and tourism policy" index, despite a slight degradation observed in Morocco, Tunisia, and Egypt compared to 2019. In 2024, cluster 1 also displays a high score in the "travel and tourism resources" index.

Key words: Tourism, Competitiveness, Index, MENA region, Clustering.

JEL Classification : L83, O53, C38, R11

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INTRODUCTION

Tourism is one of the world's most important economic sectors, making a significant contribution to international economic development. According to statistics for 2023, tourism accounted for 9.1% of global GDP, or approximately 10 trillion dollars (Statista, 2024). The growth and development of tourism within a country depend on a variety of factors, among which tourism competitiveness plays a crucial and central role. In essence, tourism competitiveness reflects a country's ability not only to attract and satisfy tourists but also to do so while ensuring sustainable economic growth and promoting the well-being of local populations.

Tourism competitiveness serves as an essential lever for the economic development of nations, particularly in regions where tourism constitutes a significant portion of the overall economy. Enhanced tourism competitiveness often leads to increased foreign exchange earnings, job creation, and substantial investment in infrastructure projects. These economic benefits can, in turn, boost other sectors, generating a virtuous circle of continuous growth and development. Furthermore, a competitive tourism destination is better positioned to withstand economic shocks and crises, owing to increased diversification and a solid and resilient tourism base.

PROBLEMATIC OF THE STUDY:

The challenges related to tourism competitiveness have evolved throughout time, both globally and specifically in the middle east and north Africa region, referencing global economic shifts, geopolitical tensions in certain areas, and more recently, the effects of the pandemic of covid 19 which has led to major upheavals in the tourism sector, changing priorities, traveler behavior and government policies.

In a global context where tourism is a key driver of economic development, the MENA region presents unique characteristics and particular challenges. The current study therefore seeks to answer the following central question:

To what extent have MENA countries experienced changes in their tourism competitiveness between 2019 and 2024?

To answer this question, it is essential to consider the following sub-questions:

- Which clusters of MENA countries have similar tourism competitiveness characteristics in the two periods studied?
- How have these clusters changed from 2019 to 2024?

STUDY AIMS:

This study aims primarily to analyze tourism and travel competitiveness in MENA countries between 2019 and 2024. Specific objectives include:

- Classifying MENA countries into clusters based on tourism competitiveness indexes.
- Compare the tourism competitiveness of MENA countries between 2019 and 2024.
- Providing a clear vision of emerging trends and transformations within the MENA tourism sector.

STUDY RELEVANCE:

The study holds significant value for tourism stakeholders and researchers as it identifies key developments and informs future strategies to strengthen tourism competitiveness in the middle eastern countries.

To fulfill the aims presented above and address the questions raised, a descriptive and analytical approach was adopted, to analyze the tourism competitiveness indexes of MENA countries for the years 2019 and 2024.

Other statistical methods were also employed, including principal component analysis and hierarchical ascending classification, using Rstudio statistical software.

1- LITERATURE REVIEW:

A great deal of research has been carried out to analyze and evaluate tourism competitiveness in various destinations around the world, as these two concepts are closely linked. This research includes:

The study by (Marti & Puertas, 2024), which aimed to analyze and evaluate whether tourism competitiveness is related to human development, as well as to identify homogeneous groups of tourists using contingency tables and clustering methods. The results showed that infrastructure is the tourism dimension with the greatest influence on human development. Moreover, conditions conducive to business and sustainability are only important for residents' quality of life in destinations with a high or very high level of progress.

The study by (Thanh Long & Khoa Tran, 2023), This study aimed to identify the factors influencing tourism competitiveness in the Mekong Delta region, factors that had not been addressed in other research. The researchers surveyed 650 tourists. A combination of qualitative and quantitative methods was used, with the final results revealing that travel infrastructure, the ecosystem, adaptability of the destination, food culture, and security and safety during travel and at the destination all play a significant role on tourism competitiveness.

The study carried out by (Pérez Léon et al, 2020) aimed to propose an index to assess the destination competitiveness in the Caribbean region. The data analysis revealed that the results highlighted the proposal of new explanatory indicators and methodological improvements in the construction of measurement instruments in order to evaluate the competitiveness of these destinations.

The research conducted by (Nazmfar et al, 2019) targeted to evaluate the competitivity of the Middle Eastern countries. The findings indicated that, despite some improvement since 2015, Egypt, Iran, Kuwait, Lebanon and Yemen have advanced positions, they have not managed to strengthen their competitiveness compared to other nations in the region. As a result, they continue to rank among the least competitive countries in terms of tourism.

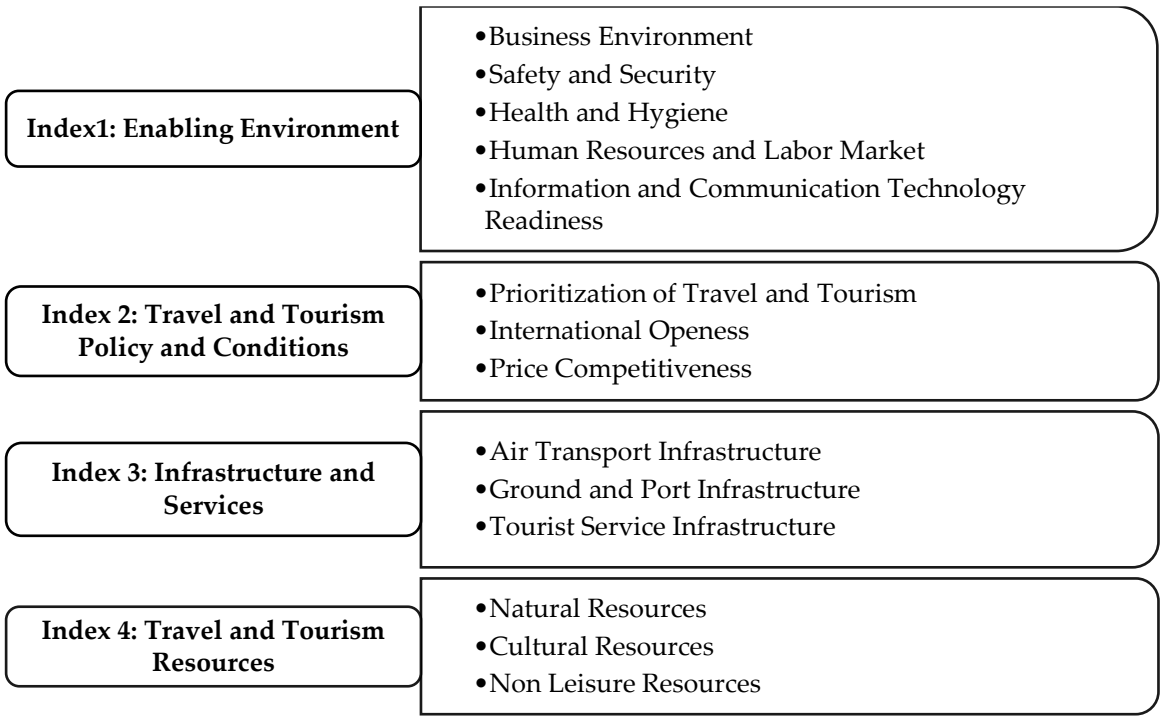
The study conducted by (Reisinger et al, 2018) focused on identifying the key factors impacting the destination competitiveness in the UAE. A sample of 218 foreign tourists was surveyed, and hierarchical regression is the statistical method that was used to analyze the impact of various variables including “tourism infrastructure”, “destination resources”, “services”, “human capital” and “commercial environment” on destination competitiveness. The findings indicated that infrastructure, services and resources at the destination play a significant role in shaping the region’s destination competitiveness.

The uniqueness of our study is its emphasis on the MENA region, examining a cohort of 13 countries over the two years 2019 and 2024. It seeks to identify shifts in tourist destination competitiveness throughout this period.

2- OVERVIEW OF THE INDEXES MEASURING TOURISM AND TRAVEL COMPETITIVENESS:

The concept of competitiveness is present in various economic sectors, comprising the tourism industry. Tourism and destination competitiveness relates to a destination’s capacity to attract higher demand than other competing destinations, by increasing its attractiveness. This translates into an increase in tourism consumption and, consequently, in the nation's tourism income. In other words, tourism competitiveness serves as an indicator of the economic vitality of the tourism industry. According to the tourism and travel development report of May 2024, this competitiveness is measured by 14 pillars (indicators) grouped into 4 indexes, as illustrated in the figure below (World Economic Forum, 2024, P. 08-09):

Figure 1: Tourism competitiveness indexes and their indicators



Source: Created by the author based on the World Economic Forum 2024. World Economic Forum. "Travel and Tourism Development Index 2024. Geneva, Switzerland, 2024.

https://www3.weforum.org/docs/WEF_Travel_and_Tourism_Development_Index_2024.pdf.

2.1- INDEX 1 "ENABLING ENVIRONMENT":

This index reflects the general conditions required to operate and invest in a country. It is made up of 5 pillars or indicators (World Economic Forum, 2024, P.08):

- **Business Environment:** This indicator is based on the ability of governments to create a favorable political environment for businesses and projects in the tourism sector. It is assessed by evaluating the safeguarding of ownership rights, the efficiency of the judicial structure, and the administration of tax and competition policies.
- **Security and Safety:** This is a crucial indicator for a destination's competitiveness in tourism. Tourists prefer to spend their holidays away from crime, violence and terrorism. This indicator is measured by taking into account the costs associated with crime, violence and terrorism, as well as the capacity of police services to provide protection against these threats.
- **Health and Hygiene:** The health sector plays a crucial role in a country's tourism competitiveness because of the interconnection between these two sectors. This indicator is assessed on the basis of the availability of doctors, hospital beds, access to drinking water, the level of sanitation and the prevalence rate of HIV and malaria. If tourism is to be as competitive as possible, it is essential that the health sector is able to guarantee that tourists are properly cared for in the event of illness.
- **Human Resources and Labor Market:** This indicator comprises two sub-indicators. The first assesses the qualifications of the labor, assessed through the school attendance rate and private sector involvement in personnel development. The second concerns the labor market, measured by its flexibility, efficiency, openness to foreign workers.
- **Information and Communication Technology Readiness:** The ICT play a crucial role in all sectors, including tourism. They help to improve tourism activities and increase the attractiveness and

competitiveness of destinations through various online operations, such as travel and accommodation booking and itinerary planning. This indicator is measured by the existence of a new material infrastructure, that encompasses mobile network availability and the reliability of the electricity service, in addition to the ability of businesses to provide online services.

2.2- INDEX 2 "TRAVEL AND TOURISM POLICY AND CONDITIONS":

This index is made up of 3 pillars and it includes the strategic factors and the particular policies which have an immediate influence on tourism (World Economic Forum, 2024, P.09):

- **Prioritization of Travel and Tourism:** It evaluates how strongly governments focus on the tourism sector, influencing travel competitiveness by organizing the necessary resources of sector development and financing tourism projects. This indicator is measured by the public expenditure allocated to tourism, the impact of marketing efforts, the nation's brand reputation and the speed with which tourism data is supplied to international organizations.
- **International Openness:** A country's tourism competitiveness requires a certain degree of international openness and easy access to improve the attractiveness of the destination and therefore its tourism competitiveness. Restrictive policies and complex visas reduce the willingness of tourists to travel to the location. It is evaluated by the quantity of regional trade agreements and the flexibility in the bilateral air transport agreements.
- **Price Competitiveness:** This indicator means that reducing the prices and costs associated with travel to a tourist destination increases its attractiveness to both inbound tourists and investors. Price competitiveness is measured through taxes on air tickets, the relative cost of hotel accommodation, the estimated cost of living and the level of fuel prices.

2.3- INDEX 3 "INFRASTRUCTURES AND SERVICES":

This index is composed of 3 indicators, and it measures the quality of material infrastructure, tourist services and their availability. (World Economic Forum, 2024, P.09):

- **Air Transport Infrastructure:** Air transport plays a crucial role in the ease of access to a destination, both for international flights and domestic travel. This indicator measures the quality of air transport infrastructure, including international and domestic flights. It is evaluated through the airport density and the quantity of active airlines and departures.
- **Ground Infrastructure:** Available transportation to tourist destinations is crucial to their success. However, it is not enough to guarantee their success. These means of transport must be supported by a transportation networks of road and rail systems, along with port facilities that complies with global standards for safety, efficiency and comfort.
- **Tourist Service Infrastructure:** The availability of quality tourist accommodation and entertainment facilities is essential to enhance the attractiveness of a destination. This is evaluated based on the availability of hotel rooms and access to services as well as presence of ATMs.

2.4- INDEX 4 "TRAVEL AND TOURISM RESOURCES":

This index represents the natural, cultural and non-leisure resources that can motivate tourists to travel to a particular destination. It is made up of (World Economic Forum, 2024, P.09):

- **Natural Resources:** Natural resources are an important factor for attracting tourists and ensuring a competitive asset. They are evaluated based on UNESCO World Heritage Sites, natural environment quality, wildlife protected areas and lands.
- **Cultural Assets or Resources** The presence of cultural resources is a key factor in a country's competitiveness as a tourist destination. It is assessed by the quantity of UNESCO World Heritage Sites, stadiums for sporting events, the number of online searches related to the country's culture (digital demand), and the number of international cultural meetings held in the country.

- **Non-Leisure Resources:** This indicator assesses the attractiveness of elements that encourage and motivate business and non-leisure travel, such as the presence of world cities and universities, among others.

3. RESEARCH METHODOLOGY:

The methodology of this study can be summarized in these two aspects:

3.1- DATA PRESENTATION:

The data utilized in this research primarily comprises the scores of the various indexes that constitute the "Global tourism competitiveness index", presented by the World Economic Forum in its annual reports for 2019 and 2024, the two periods of interest. These indexes, which constitute the variables of our study, are four in number and include a total of 14 indicators.

We chose these two years because of their relevance; 2019, the year preceding the Covid-19 pandemic, and 2024, which provides recent data and marks the recovery of tourism activities worldwide.

The data also includes observations from countries in the MENA region, our area of interest. We selected 13 countries after excluding Yemen, Syria and Libya due to the absence of data on tourism competitiveness indexes. As a result, our sample includes the following countries[1]: Algeria, Morocco, Tunisia, Egypt, Qatar, Bahrain, Kuwait, Saudi Arabia, United Arab Emirates, Oman, Lebanon, Jordan and Iran.

3.2 ANALYSIS METHODS:

To meet our research objectives, we have chosen a descriptive analytical approach, using several specific analysis tools:

- **Descriptive analysis of tourism competitiveness indexes:** This method provides a crucial overview of the evolution of tourism competitiveness index scores between 2019 and 2024 in MENA countries.
- **Principal Component Analysis (PCA):** PCA, a multivariate analysis method, will be used to visualize the countries in our study in a two- or three-dimensional space. This will make it easier to interpret the relationships between countries.
- **Clustering analysis**: Clustering, an unsupervised learning method, will be used to group MENA countries into homogeneous clusters in terms of tourism competitiveness. This approach will help us to identify groups of countries sharing similar characteristics, allowing an in-depth analysis of the differences and similarities in their tourism performance.

4. PRESENTATION AND ANALYSIS OF THE STUDY RESULTS:

4.1- EVOLUTION OF TOURISM COMPETITIVENESS INDEX SCORES BETWEEN 2019 AND 2024:

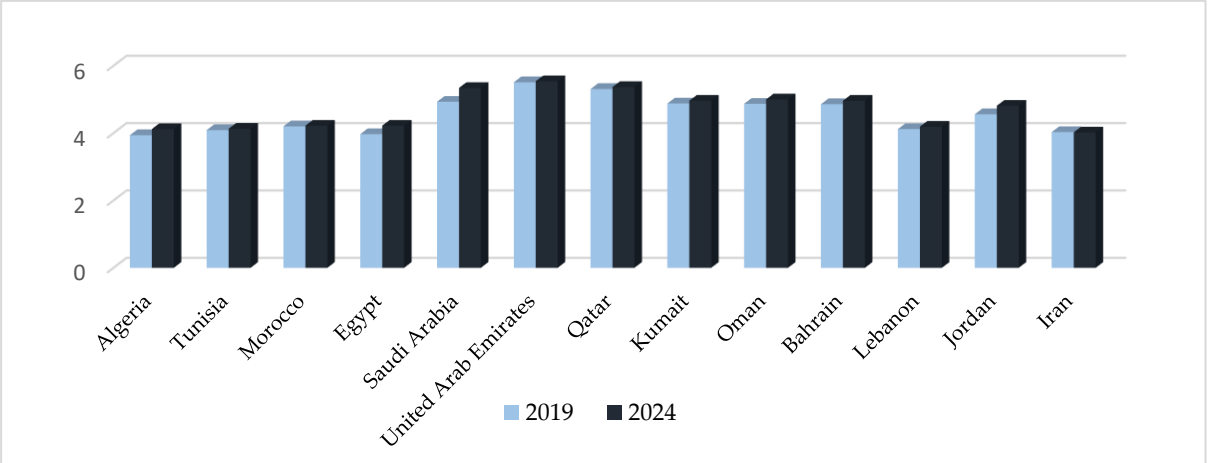
We will look in this section at the evolution of the four main indexes of tourism and travel competitivity in MENA countries between 2019 and 2024:

4.1.1- THE "ENABLING ENVIRONMENT" INDEX BETWEEN 2019 AND 2024:

The figure below shows this evolution for each country in the study sample (MENA countries):

[1] These countries are classified in the MENA region according to the World Economic Forum report for the year 2024

Figure 2: Changes in scores of index 1 "Enabling Environment" between 2019 and 2024



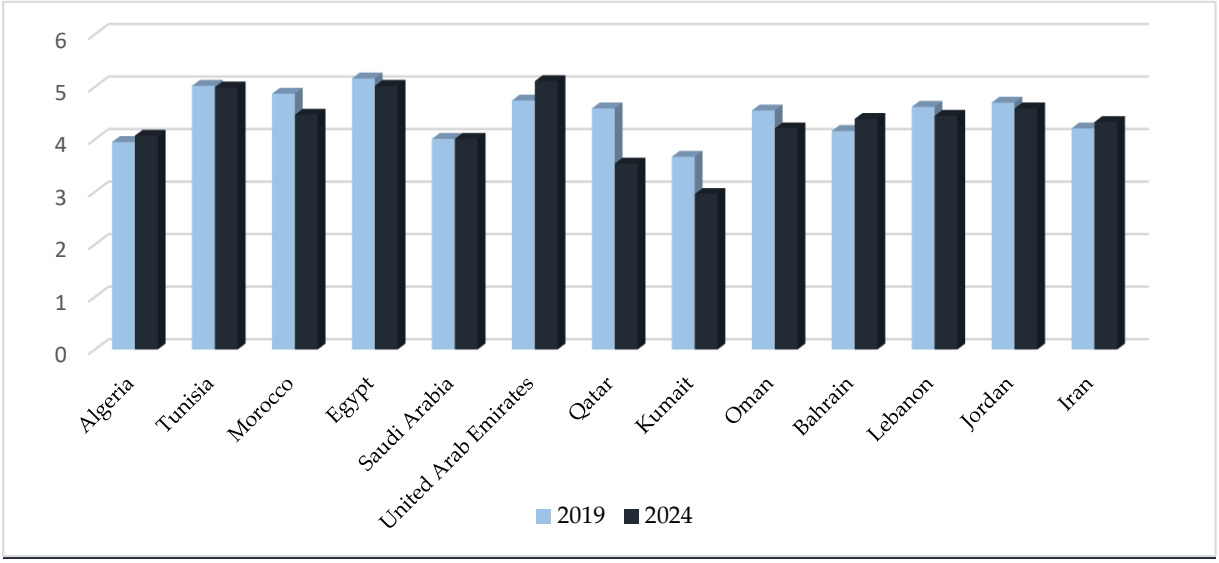
Source: Created by the author using Excel 2019 software

The figure above illustrates a modest increase, not exceeding 10%, in the scores for this index across the majority of countries in the region. For example, Saudi Arabia saw an increase of +8.31%, Egypt +6.29%, Jordan +5.48%, Algeria +4.56% and Morocco +0.47%. These increases are mainly due to the economic reforms adopted in these countries. Saudi Arabia, with its Vision 2030 plan, has focused on non-oil sectors, notably tourism. The United Arab Emirates has adopted a tourism development strategy for 2031, with the emphasis on encouraging investment in this sector. Qatar, as part of its digital agenda 2023, has set targets for the development of various sectors, including digital technologies, which are included in the indicators of the "Enabling Environment" index. Similarly, Egypt has implemented an economic reform programme with a number of objectives, including the protection of national security, which falls within the scope of this index.

4.1.2- THE " TOURISM POLICY AND CONDITIONS" INDEX BETWEEN 2019 AND 2024:

The following figure shows this trend for each country in the study sample (MENA countries):

Figure 3: Changes in scores of index 2 "Travel and Tourism Policy and Conditions" between 2019 and 2024



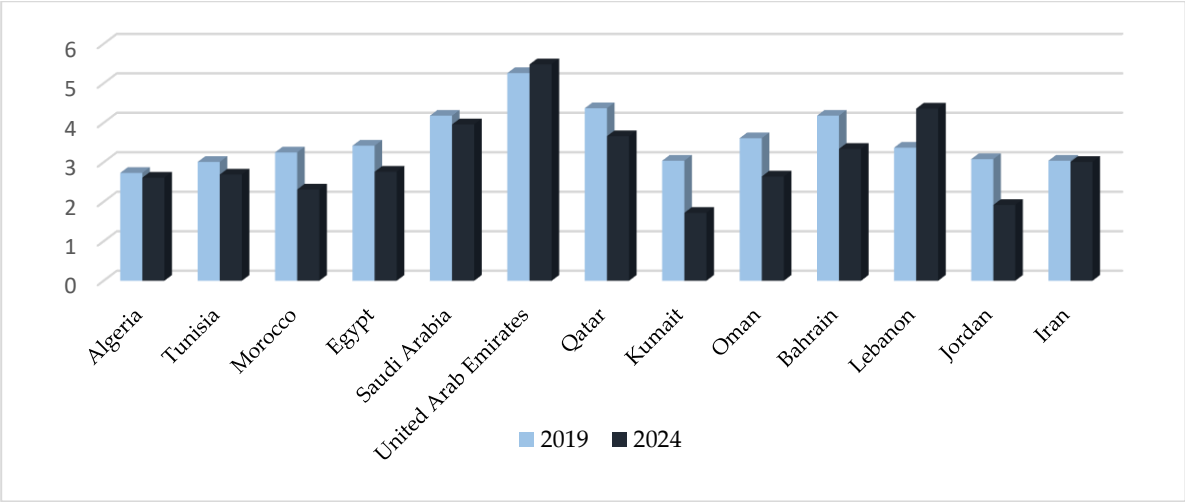
Source: Created by the author using Excel 2019 software

According to the bar chart above, Algeria, the Emirates, Bahrain and Iran recorded a slight increase in this index in 2024 compared to 2019, with rises of 3.04%, 7.81%, 5.53% and 2.85% respectively. These increases are credited to the enhanced score of the indicator related to the prioritization tourism, which is an element of this index, in comparison to the scores recorded in 2019, Algeria saw an increase of 0.38/7 in 2024, Emirates by 1.5/7, Bahrain by 0.65/7 and Iran by 0.12/7. This reflects the increased importance attached to the tourism sector by these countries in recent years (for example, Algeria's SDAT strategy for 2030 and Bahrain's Economic Recovery Plan for 2026). On the other hand, a slight decrease was observed in other countries in the region, notably Qatar and Kuwait, with declines of -22.88% and -19.35% respectively compared with the 2019 scores. These decreases are mainly due to lower scores for the 'price competitiveness' indicator, a component of this index, dropping from 5.55/7 to 3.34/7 for Qatar and from 4.48/7 to 3.74/7 for Kuwait.

4.1.3- THE "INFRASTRUCTURES AND SERVICES" INDEX BETWEEN 2019 AND 2024:

The figure below shows this evolution for each country in the study sample (MENA countries) between the two periods studied:

Figure 4: Changes in scores of index 3 "Infrastructure and Services" between 2019 and 2024



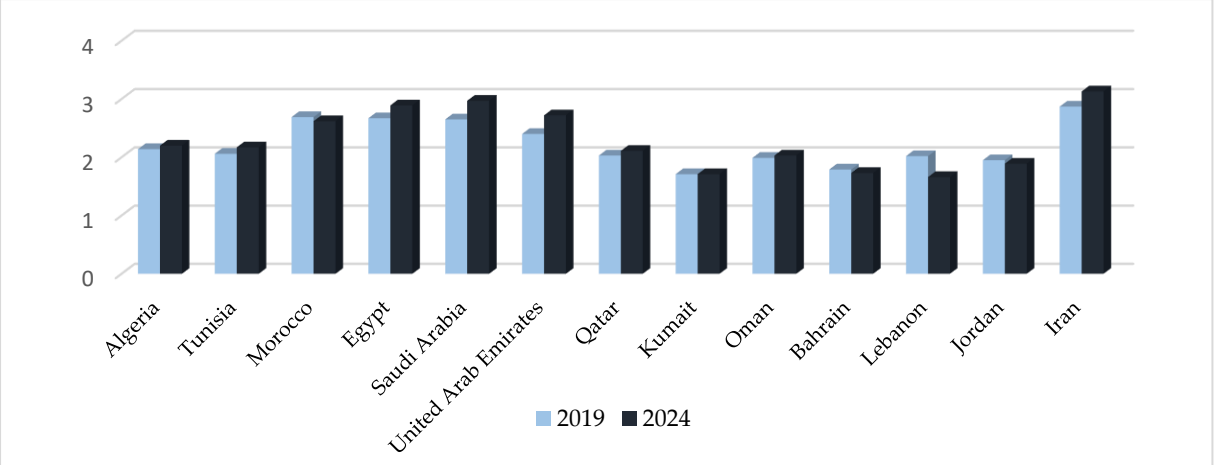
Source: Created by the author using Excel 2019 software

It is notable from the bar chart above that every country in the sample registered a decline in their score for this index, except for the UAE and Lebanon that posted increases of 4.18% and 29.38% respectively. These increases can be linked to the development of scores in the indicator "tourism services and infrastructure", which rose from 4.21 in 2019 to 4.36 in 2024 for Lebanon, and to the increases in the scores for air transport infrastructure (from 6.49 to 6.52), enabling the Emirates to rank first in the world, for land and port infrastructure (from 4.51 to 4.67), and for tourism services infrastructure (from 4.79 to 5.48) for the Emirates. In terms of decreases, the most notable was in Kuwait (-43.42%), followed by Jordan (-37.66%), Morocco (-28.92%), Oman (-26.87%) and Bahrain (-20.1%). These decreases are mainly due to lower scores on the indicators related to "air transport infrastructure" and "Tourism services" for those nations: Morocco, Bahrain, Oman, Algeria and Tunisia, as well as to lower scores on a single indicator, "tourism services and infrastructure" , for Jordan and Kuweit.

4.1.4. THE "TOURISM RESOURCES" INDEX BETWEEN 2019 AND 2024:

The figure below shows this trend for each country in the study sample (MENA countries):

Figure 5: Changes in scores of index 4 "Travel and Tourism Resources"



Source: Created by the author using Excel 2019 software

According to the evolution of index 4 related to "travel and tourism resources", we can see that some countries have seen an increase in their scores compared to 2019. These include significant increases for the Emirates (+13.33%), Saudi Arabia (+12.08%), Iran (+9.06%) and Egypt (+8.24%). These increases were mainly driven by higher scores in the "non leisure resources" indicator for the Emirates, as well as in "natural & cultural resources" for Iran, and the three indicators making up this index for Saudi Arabia and Egypt. On the other hand, four other countries recorded a negative change compared to 2019, including Lebanon (-17.82%), Bahrain (-3.35%), Jordan (-3.08%) and Morocco (-2.06%). These decreases are mainly due to lower scores on the indicator related to non-leisure resources.

4.2- PRINCIPAL COMPONENTS ANALYSIS:

To better visualize the observations (countries in the region) and variables (tourism competitiveness indexes) over the two periods studied, it is essential to conduct two distinct analysis: for the 2019 and 2024 data.

4.2.1. PRINCIPAL COMPONENT ANALYSIS OF TOURISM COMPETITIVENESS INDEXES IN 2019:

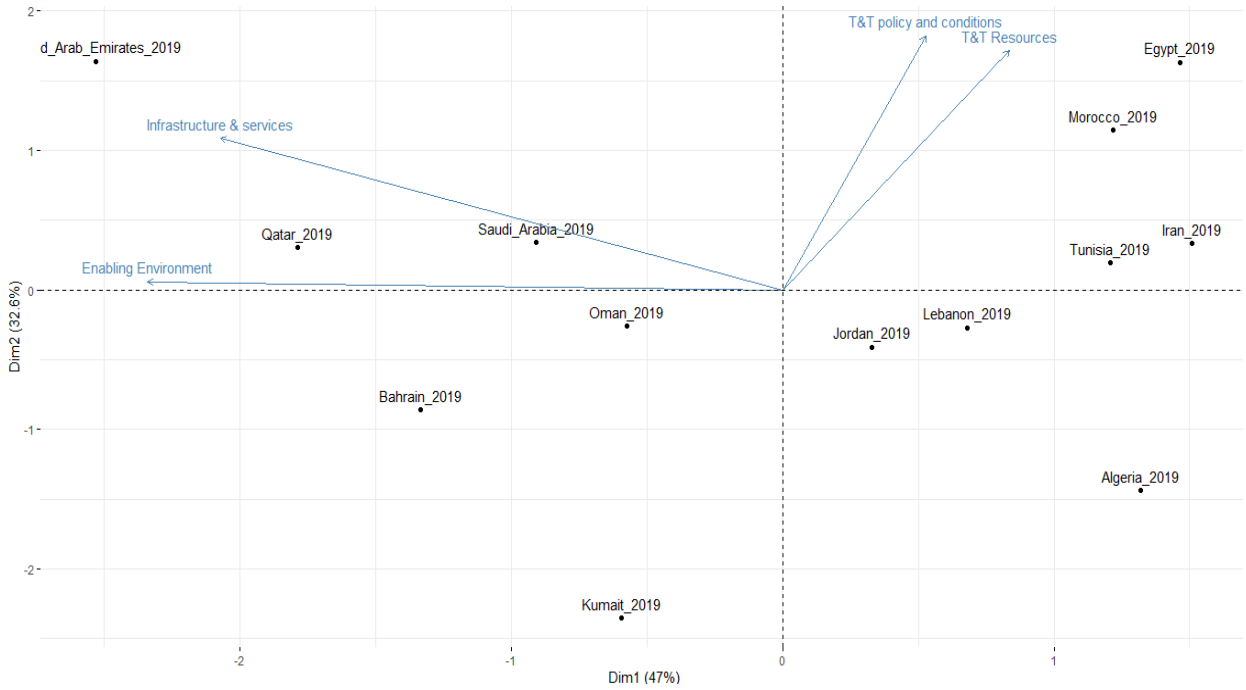
From the eigenvalue table presented below, the analysis focuses on the first two components, since the inertia percentage is 79.6%. This signifies that the principal plane explains 79.6% of the total information, making the first two axes sufficient.

Table 1: Eigenvalues from PCA for 2019 data

	Principal component 1	Principal component 2	Principal component 3	Principal component 4
Standard deviation	1.3716	1.1424	0.8549	0.2877
Proportion of variance	0.4703	0.3263	0.1827	0.0207
Cumulative proportion	0.4703	0.7966	0.9793	1.0000

Source: Created by the author based on results extracted from the Rstudio software

Figure 6: Graphical representation of countries and indices – 2019



Source: Created by the author with R-studio

The graph shows that the first axis represents 47% of the total inertia, reflecting the highest eigenvalue, which is 1.3716. The second axis represents 32.6% of the total inertia, corresponding to the second eigenvalue, which is 0.3263. Regarding the quality of variable representation, it is observed that the 4 variables are well represented in the factorial plane (axis 1 and axis 2).

It can be observed that axis 1 divides the countries into two distinct categories. On one hand, the countries on the positive side of the axis exhibit a certain similarity in terms of tourism competitiveness, as their points are close on the graph. This is particularly true for Egypt, Morocco, Tunisia, Iran, Lebanon, and Jordan. On the other hand, on the negative side of the axis, we find some countries of the Gulf region, represented by Qatar, Oman, and Saudi Arabia.

It is also noted that the UAE, Qatar, and Bahrain achieve high scores in the "Enabling Environment" and "Infrastructure and Services" indices, in contrast to Iran, Egypt, and Tunisia. Moreover, the UAE, Egypt, and Morocco record strong scores in the "Travel and Tourism Policy and Conditions" and "Travel and Tourism Resources" indices, in contrast to Algeria and Kuwait.

4.2.2- PRINCIPAL COMPONENT ANALYSIS OF TOURISM COMPETITIVENESS INDICES IN 2024:

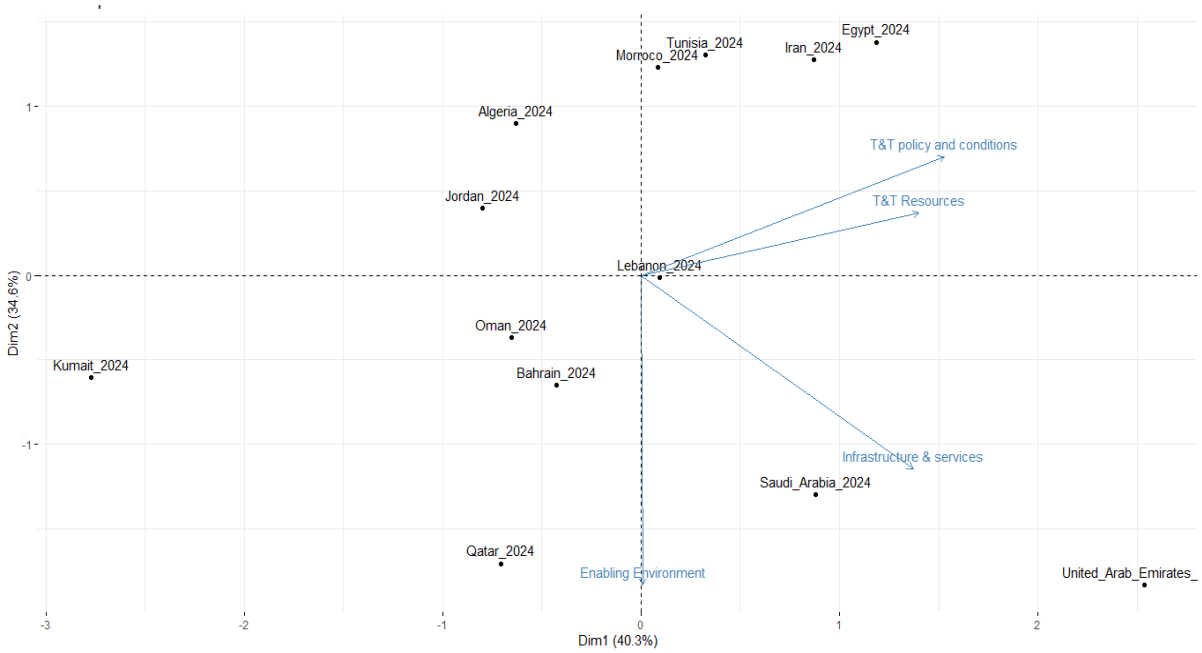
According to the eigenvalue table presented below, the analysis focuses on the first two components, as the inertia percentage is 74.86%. This means that the principal plane explains 74.86% of the total information, making the first two axes sufficient.

Table 2: Eigenvalues from PCA for 2024 data

	Principal component 1	Principal component 2	Principal component 3	Principal component 4
Standard deviation	1.2691	1.1764	0.8308	0.56150
Proportion of variance	0.4027	0.3460	0.1726	0.07882
Cumulative proportion	0.4027	0.7486	0.9212	1.0000

Source: Created by the author based on results extracted from the Rstudio software

Figure 7: Graphical Representation of countries and indices – 2024



Source: Created by the author using Rstudio software

According to the graph, the first axis represents 40.3% of the total inertia, corresponding to the largest eigenvalue, which is 1.2691. The second axis represents 34.6% of the total inertia, corresponding to the second eigenvalue, which is 0.3263. Regarding the quality of variable representation, it is observed that the four variables are well represented in the factorial plane (axes 1 and 2).

It is noted that the Emirates and Egypt record high scores in the 'Travel and Tourism Policy and Conditions" , "Tourism Resources", and "Infrastructure & Services" indexes, dissimilar to Kuwait. Furthermore, according to axis 2, the UAE, Qatar, and Saudi Arabia stand out with high scores in the 'Enabling Environment' and 'Infrastructure and Services' indexes, in contrast to Egypt, Tunisia, Iran, Morocco, and Algeria.

4.3- CLUSTERING ANALYSIS:

The method used to create homogeneous clusters of countries in terms of tourism competitiveness for the periods 2019 and 2024 is the hierarchical clustering method, based on Ward's method.

4.3.1. CLUSTERING EXAMINATION FOR THE YEAR 2019:

The silhouette index was employed to determine the optimal number of clusters, and its results are shown below:

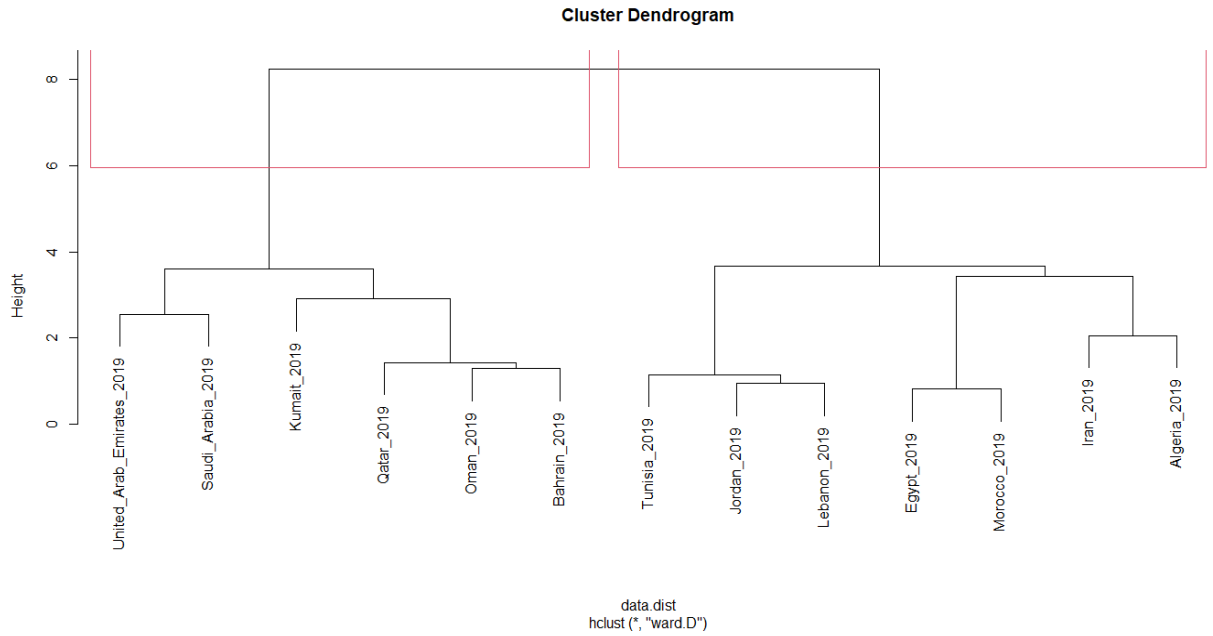
Table 3: Silhouette index values for each number of clusters

Number of clusters	2	3	4
Silhouette index value	**0.2949886**	0.1815268	0.1681587

Source: Created by the author based on the study results via Rstudio.

The silhouette scores reveal that the best number of clusters is two. The countries groups within each cluster are shown in the dendrogram below:

Figure 8: Dendrogram of MENA countries based on tourism competitiveness indices in 2019



Source: Created by the author using Rstudio software

The clustering analysis revealed that the MENA countries studied in 2019 are divided into two clusters:

Cluster 1: This cluster includes the United Arab Emirates, Saudi Arabia, Kuwait, Qatar, Oman, and Bahrain. All those countries belong to the Gulf region, sharing a common geographic area, exhibit similarity in terms of tourism competitiveness for the year 2019. They are often characterized by resource-rich economies, thanks to their oil and gas reserves. They invest heavily in high-quality tourism infrastructure and services, with well-developed infrastructure such as airports, hotels, and shopping centers. The governments of these countries also invest in international events, cultural attractions, and entertainment projects to attract more tourists.
Cluster 2: This cluster comprises Tunisia, Jordan, Lebanon, Egypt, Morocco, Iran, and Algeria. These countries share a certain similarity in terms of tourism competitiveness for the year 2019, with notable cultural and historical richness, including many World Heritage sites, diverse natural landscapes, and historical tourist attractions. However, they may face economic fluctuations and political instabilities, which can limit their ability to maintain a level of tourism infrastructure investment similar to that of the countries in the first cluster. .

To examine the two classes, one can refer to the averages of each tourism competitiveness index presented in the table below

Table 4: Averages of the variables (competitiveness indexes) for each cluster

	Index 1 : « Enabling environment »	Index 2: "Travel and tourism policy and conditions"	Index 3: "Infrastructure and services"	Index 4: "Travel and tourism resources"
Cluster 1	5.06	4.287	4.107	2.095
Cluster 2	4.13	4.647	3.129	2.343

Source: Created by the author based on the study results

The results show that Cluster 1 has higher average scores in the 'Enabling Environment' and 'Infrastructure and Services' indexes compared to Cluster 2. This suggests that these countries offer a more favorable environment for tourism development, due to political and economic factors such as political stability, economic stability, and security. These countries are focused on investing in tourism infrastructure and adopting advanced technologies and innovations, thereby facilitating visitors' access to tourism services.

In contrast, countries in Cluster 2 achieved higher average scores in the 'Travel and Tourism Policy and Conditions' index, with a slight difference compared to Cluster 1. This can be attributed to political initiatives favorable to tourism development, such as visa facilitation, tourism promotion through subsidies, tax incentives, and other forms of support for tourism businesses. Additionally, countries in Cluster 2 also stand out in the "Travel &Tourism Resources" index, highlights the variety and wealth of their natural and cultural resources, compared to countries in Cluster 1.

4.3.2. CLUSTERING ASSESSMENT FOR THE YEAR 2024:

The results of the silhouette index are presented below:

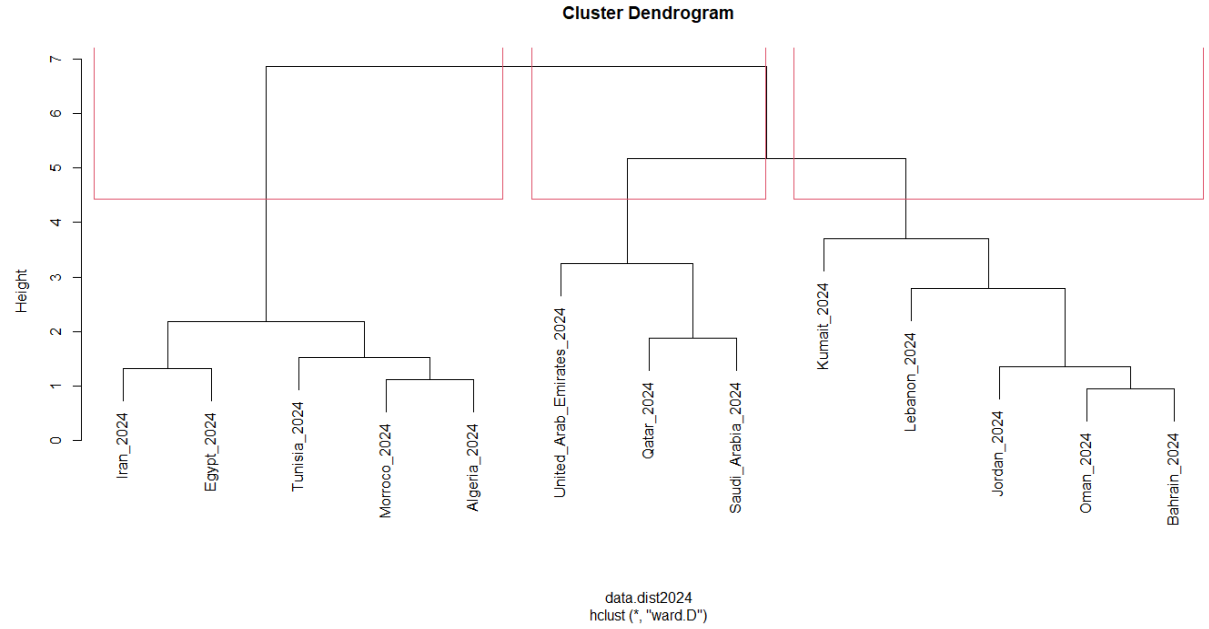
Table 5: Silhouette index values for each number of clusters

Number of clusters	2	3	4
Silhouette index value	0.2178119	**0.2495864**	0.2392774

Source: Created by the author based on the study results from Rstudio

The silhouette index scores indicate that the optimal number of clusters is three. The grouping of countries within each cluster is illustrated in the dendrogram below:

Figure 9: Dendrogram of MENA countries based on tourism competitiveness indices in 2024



Source: Created by the author using Rstudio software

The clustering analysis revealed that the MENA countries studied in 2024 are divided into three clusters:

Cluster 1: This cluster includes the North African countries of Egypt, Tunisia, Morocco, and Algeria, as well as Iran, which is part of Asia. These countries attract tourists due to their rich cultural and natural heritage, as well as the accessibility available in most of these destinations.

Cluster 2: This cluster includes three Gulf countries: the UAE, Qatar, and Saudi Arabia. These countries, generally politically and economically stable, offer a favorable environment for tourism development. Their wealth in hydrocarbons allows them to invest heavily in tourism infrastructure.
Cluster 3: This cluster comprises Kuwait, Lebanon, Jordan, Oman, and Bahrain. These countries present a mix of modern infrastructure and cultural and natural resources.

To compare the three clusters, one can refer to the averages of each tourism and travel competitiveness index illustrated below in the table 6:

Table 6: Mean values of competitiveness indices by cluster

	Index 1 : « Enabling environment »	Index 2: "Travel and tourism policy and conditions"	Index 3: "Infrastructure and services"	Index 4: "Travel and tourism resources"
Cluster 1	4.142	4.576	2.676	2.62
Cluster 2	5.417	4.22	3.367	2.6
Cluster 3	4.784	4.12	2.796	1.804

Source: Created by the author based on the study results

According to the results presented above, Cluster 1 exhibits the highest mean scores for the "Travel and Tourism Resources" and "Travel and Tourism Policy and Conditions" indexes when compared to cluster 2 and 3. This can be explained by the adoption of proactive tourism policies, such as marketing campaigns, tourism promotion, and favorable regulations. Additionally, the cultural and historical wealth of the nations of this cluster, along with the diversity of their natural attractions, attract tourists.
In contrast, cluster 2 achieves the top scores in the "Enabling Environment" and "Infrastructure and Services" indexes, attributed to the political and economic stability of the three countries in this cluster, which fosters a conducive business and tourism investment environment. The adoption of advanced technologies and innovations in infrastructure also helps facilitate access to tourism services.
Cluster 3 ranks second for the "Enabling Environment" and "Infrastructure and Services" indexes, and third for the "Tourism Policy and Conditions" and "Tourism Resources" indexes.

4.3.3. EXAMINATION OF CHANGES IN CLUSTERS BETWEEN 2019 AND 2024:

Comparing the clusters from 2019 and 2024, the following changes have been observed:

The UAE, Qatar, and Saudi Arabia were moved from Cluster 1 to Cluster 2. Cluster 2 is characterized first by an improvement in the score related to the "Enabling Environment" index, indicating that these countries have enhanced their tourism competitiveness by enhancing their business environment, ensuring security, maintaining economic and political stability, and fostering the development and promotion of tourism resources. Secondly, it shows a high score in the 'Infrastructure and Services' index, but a slight decline in this index's score compared to 2019 for two countries in this cluster, Qatar and Saudi Arabia. This decline is mainly due to a decrease in the score related to the 'Tourist Service and Infrastructure' indicator, which may be attributed to several factors, including the COVID-19 pandemic. The pandemic caused temporary closures and capacity reductions due to health restrictions lasting approximately one and a half to two years, leading to a decline in the quality and availability of tourism services, negatively impacting this indicator. The health crisis also resulted in a loss of qualified workers in the tourism industry, which causes a decline in service quality.
Kuwait, Oman, and Bahrain were moved from Cluster 1, which had strong competitiveness in terms of 'Enabling Environment' and 'Infrastructure and Services,' to Cluster 3. Cluster 3 is characterized by moderate

competitiveness in terms of "Enabling Environment" and comparatively low level of competitiveness regarding "Travel and Tourism Resources".

Algeria, Tunisia, Morocco, Egypt, and Iran were grouped into Cluster 1 after being moved from Cluster 2. Cluster 1 is primarily characterized by a relatively high score in the 'Travel and Tourism Policy and Conditions' index, which has seen a slight degradation compared to 2019 for countries like Tunisia, Morocco, and Egypt. This degradation is attributed to a slight decrease in price competitiveness, which may be related to the global health crisis that led to additional costs following the reopening of flights (disinfection, protective equipment, COVID-19 tests, etc.), which were passed on to tourism service prices, making these destinations less competitive in terms of price. Cluster 1 is also characterized by strong tourism competitiveness in the context of "Travel and Tourism Resources" because of their natural richness, cultural and historical heritage, such as archeological sites, historical monuments and cultural traditions that capture the interest of people, thereby enhancing the competitiveness of these destinations in terms of tourism resources.

Jordan and Lebanon were moved from Cluster 2, which was characterized by strong competitiveness in terms of 'Travel and Tourism Policy and Conditions,' to Cluster 3, which experienced a relatively minor degradation in this index. This degradation is primarily due to a decrease in the score related to price competitiveness, which can be attributed to the COVID-19 health crisis that led to additional costs and thus an increase in the prices of tourism products and services.

CONCLUSION:

Based on this study, which analyzed tourism competitiveness indexes in the MENA region, it can be concluded that the clustering analysis revealed two distinct clusters in 2019. The first cluster included the UAE, Saudi Arabia, Qatar, Kuwait, Oman, and Bahrain. This group was distinguished by its performance in the 'Enabling Environment' index, due to the political and economic stability, as well as the security of these countries, alongside the 'Infrastructure and Services' index, due to their investment in tourism infrastructure and adoption of advanced technologies. The second cluster included Algeria, Tunisia, Morocco, Egypt, Jordan, Lebanon, and Iran, which are distinguished by their strengths in the "Travel and Tourism Policy and Conditions" index, due to favorable political initiatives, as well as in the 'Travel and Tourism Resources' index due to their attractive natural and cultural resources.

In 2024, following global upheavals, notably the COVID-19 pandemic, the analysis of the clusters revealed three clusters, reflecting a change in the tourism and Travel competitiveness among the countries in the region. Cluster 1 includes Algeria, Tunisia, Morocco, Egypt, and Iran, which have retained their force in the "Tourism Policy" and "Travel and Tourism Resources" indexes, even though Jordan and Lebanon are no longer part of this cluster. Cluster 2 includes the UAE, Qatar, and Saudi Arabia, which have retained their strength in the 'Enabling Environment' index with a slight improvement compared to 2019, as well as in the 'Infrastructure and Services' index, despite a slight degradation. Cluster 3 comprises Bahrain, Oman, Kuwait, Jordan, and Lebanon, which are marked by decreased scores in the "infrastructure and Services" and "Tourism and Travel Resources" indexes and moderate scores in the "Enabling Environment" and "Travel and Tourism Policy and Conditions" indexes.

For future research, it would be interesting to extend the study to other regions of the world to allow for global comparisons.

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APPENDICES :

Appendix 1: Tourism competitiveness indices - 2019

	Index 1	Index 2	Index 3	Index 4
UAE_2019	5,51	4,74	5,26	2,4
Qatar_2019	5,31	4,59	4,37	2,03
Oman_2019	4,87	4,55	3,61	1,99
Bahrain_2019	4,86	4,16	4,18	1,79
Saudi_Arabia_2019	4,93	4,01	4,18	2,65
Jordan_2019	4,56	4,7	3,08	1,95
Iran_2019	4,03	4,21	3,04	2,87
Kumait_2019	4,88	3,67	3,04	1,71
Lebanon_2019	4,12	4,62	3,37	2,02
Egypt_2019	3,97	5,16	3,42	2,67
Morocco_2019	4,2	4,87	3,25	2,69
Tunisia_2019	4,09	5,02	3,01	2,06
Algeria_2019	3,94	3,95	2,73	2,14

Source : https://www3.weforum.org/docs/WEF_TTCR_2019.pdf

Appendix 2 : Tourism competitiveness indices - 2024

	Index 1	Index 2	Index 3	Index 4
UAE_2024	5,54	5,11	5,48	2,72
Qatar_2024	5,37	3,54	3,66	2,11
Oman_2024	5	4,21	2,64	2,03
Bahrain_2024	4,96	4,39	3,34	1,73
Saudi_Arabia_2024	5,34	4,01	3,96	2,97
Jordan_2024	4,81	4,59	1,92	1,89
Iran_2024	4,02	4,33	3,01	3,13
Kumait_2024	4,96	2,96	1,72	1,71
Lebanon_2024	4,19	4,45	4,36	1,66
Egypt_2024	4,22	5,02	2,76	2,89
Morroco_2024	4,22	4,47	2,31	2,62
Tunisia_2024	4,13	4,99	2,69	2,17
Algeria_2024	4,12	4,07	2,61	2,2

Source : https://www3.weforum.org/docs/WEF_Travel_and_Tourism_Development_Index_2024.pdf.

Appendix 3 : Eigenvalues from PCA for 2019 data

```
                          PC1    PC2    PC3    PC4
Standard deviation     1.3716 1.1424 0.8549 0.2877
Proportion of Variance 0.4703 0.3263 0.1827 0.0207
Cumulative Proportion  0.4703 0.7966 0.9793 1.0000
```

Source: Rstudio software

Appendix 4 : Eignevalues from PCA for 2024 data

```
                          PC1    PC2    PC3     PC4
Standard deviation     1.2691 1.1764 0.8308 0.56150
Proportion of Variance 0.4027 0.3460 0.1726 0.07882
Cumulative Proportion  0.4027 0.7486 0.9212 1.00000
```

Source : Rstudio software

Appendix 5: R code for calculating silhouette index for each number of clusters- 2019 data

```
> clusters2<-cutree(cah.data2019,k=2)
> sil2<-silhouette(clusters2,data.dist2019)
> sil_score2<-mean(sil2[,"sil_width"])
> sil_score2
[1] 0.2949866
> clusters3<-cutree(cah.data2019,k=3)
> sil3<-silhouette(clusters3,data.dist2019)
> sil_score3<-mean(sil3[,"sil_width"])
> sil_score3
[1] 0.1815268
> clusters4<-cutree(cah.data2019,k=4)
> sil4<-silhouette(clusters4,data.dist2019)
> sil_score4<-mean(sil4[,"sil_width"])
> sil_score4
[1] 0.1681587
```

Source: Rstudio software

Appendix 6 : R code for calculating silhouette index for each number of clusters - 2024 data

```
> sil_score2<-mean(sil2[,"sil_width"])
> sil_score2
[1] 0.2178119
> clusters3<-cutree(cah.data2024,k=3)
> sil3<-silhouette(clusters3,data.dist2024)
> sil_score3<-mean(sil3[,"sil_width"])
> sil_score3
[1] 0.2495864
> clusters4<-cutree(cah.data2024,k=4)
> sil4<-silhouette(clusters4,data.dist2024)
> sil_score4<-mean(sil4[,"sil_width"])
> sil_score4
[1] 0.2392774
```

Source : Rstudio software