

**WHAT MACRECONOMIC INDEX DIFFERENTIATES OR SIMILAR
THE EUROPEAN TOURISM COMPETITIVENESS?
A MULTIMETHOD ANALYSIS**

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ABSTRACT

In the current economic context countries are exposed to long-term structural shifts that challenge tourism development strategies and range from destination marketing to product offerings and infrastructure planning. Tourism nations need to ensure their long-term competitiveness with a consistent sustainability perspective. In the present paper, we aimed at carrying out a research on the European countries tourism competitiveness using statistical data analysis tools, respectively non-parametric correlations and non-parametric statistic tests. Our analysis is based on the 14 pillars described in the Travel & Tourism Competitiveness Report 2015 - World Economic Forum taking into consideration only the European countries. Using the non-parametric statistical methods has emphasized aspects that are not noticeable directly from ranking carried-out by the World Economic Forum based on The Travel & Tourism Competitiveness Index. Completing the previous results, this research points out that, of the 14 pillars of T&TCI the strongest direct correlation is between air transport and ICT infrastructure, i.e. those pillars that led to the fact that, the Top 10 countries are clearly differentiated by the other groups. We have also emphasized that human resources is another important pillar that differentiates the ranks of the 42 countries, being medium correlated with price competitiveness and cultural resources. The results of this research will be the base of applying some other statistical methods, for instance, analysis of discriminating order to study thoroughly and better the differences or similarities between the 42 European countries.

KEYWORDS: *tourism competitiveness index, European country, non-parametric statistics test, non-parametric correlations*

JEL CLASSIFICATION: *C12, C14, E00, E03, O11, 047, Z32*

1. INTRODUCTION

In the current economic context countries are exposed to long-term structural shifts that challenge tourism development strategies and range from destination marketing to product offerings and infrastructure planning. There are many forces that shape the future of the travel and tourism sector such as: a continental drift of economic gravity to the East, lack of growth in Western hemisphere markets, and shifting travel patterns to more regional or domestic travel. It is important to note that, from a policymaker's point of view, domestic spending directly supports the home economy because it originates from residents who would have otherwise spent their money abroad. In the longer run, domestic tourism may gain even more importance because regional travelers will aim to avoid the increasing cost of long-haul travel and benefit from lower transport costs to domestic destinations (Travel & Tourism Competitiveness Report 2015 - World Economic Forum).

In this respect, regionally focused and domestic tourism is playing an increasingly important role in traditional and emerging tourism economies because residents of emerging nations tend to explore neighboring regions before taking long-haul trips, and Europeans redirect parts of their travel activity to inland destinations to save money. It will be important for policymakers to put regional and domestic tourism on their T&T development agenda when looking at the sector as a whole (Travel & Tourism Competitiveness Report 2015 - World Economic Forum). Tourism nations need to ensure their long-term competitiveness with a consistent sustainability perspective. This includes the expansion of touristic services from mass market to additional high-yield segments. Considering environmental regulation and respective customer preferences for more eco-friendly travel in this respect will become a key differentiator in the future. In this respect, in the present paper we aimed at carrying out a research on the European countries tourism competitiveness using statistical data analysis tools, respectively non-parametric correlations (Kendall and Spearman correlations) and non-parametric statistic tests (U Mann – Whitney test, Kolmogorov – Smirnov test and Kruskal – Wallis test).

Our analysis is based on the 14 pillars described in the Travel & Tourism Competitiveness Report 2015 - World Economic Forum

(http://www3.weforum.org/docs/TT15/WEF_Global_Travel&Tourism_Report_2015.pdf)

taking into consideration only the European countries.

In a previous research (Gabor, Oltean & Conțiu, 2012) we applied another statistical methods (PCA – principal component analysis and cluster analysis) and we find that applying cluster analysis led to the clustering of European countries in Nordic countries (cluster 1), countries that practice predominantly sunlust tourism (cluster 2), former communist countries (cluster 5), and there is a cluster that brings together two atypical countries, namely Poland and Romania (cluster 4) and a combined group of Nordic countries and former communist countries (cluster 3). This research fills out the previous results published by the authors (Gabor, Oltean & Conțiu, 2012) and, by means of non-parametric statistical methods studies thoroughly and emphasizes other aspects as well related to measuring and especially ranking of tourism competitiveness in European countries.

2. METHODOLOGY

The TTC Index aims to measure *the factors and policies that make it attractive to develop the T&T sector in different countries*. It is based on three broad categories of variables that facilitate or drive T&T competitiveness. These categories are summarized into the three sub-indexes of the Index:

- (1) the T&T regulatory framework sub-index;
- (2) the T&T business environment and infrastructure sub-index; and
- (3) the T&T human, cultural and natural resources sub-index.

The first sub-index captures those elements that are policy related and generally under the purview of the government; the second sub-index captures elements of the business environment and the “hard” infrastructure of each economy; and the third sub-index captures the “softer” human, cultural, and natural elements of each country’s resource endowments. Each of these three sub-indexes is composed in turn by a number of pillars of T&T competitiveness, of which there are 14 in all.

These are:

1. *Policy rules and regulations,*
2. *Environmental sustainability,*
3. *Safety and security,*
4. *Health and hygiene,*
5. *Prioritization of Travel & Tourism,*
6. *Air transport infrastructure,*
7. *Ground transport infrastructure,*
8. *Tourism infrastructure,*
9. *ICT infrastructure,*
10. *Price competitiveness in the T&T industry,*
11. *Human resources,*
12. *Affinity for Travel & Tourism,*
13. *Natural resources,*
14. *Cultural resources* (Travel & Tourism Competitiveness Report 2015 - World Economic Forum).

To analyze the direction and intensity of the correlations between the 14 pillars of competitiveness index for all 42 European countries monitored, we applied Spearman and Kendall nonparametric correlations. Though in practice, the results of the two tests – Spearman and Kendall – are never very different, interpretation of coefficients is not the same (Giannelloni and Vernet, 2003, p. 370).

We elaborated a hypothesis - *There are statistically significant differences between the ranks of the European countries according to various economic and political characteristics* - East / Central and Western European countries, former communist or democratic states, EU or non-EU countries, developed or developing (emerging) countries. In order to test the hypothesis, we used non-parametric tests:

- Kolmogorov - Smirnov (for two independent samples) is encountered in the surveyed literature and as an adjusting test on a specified law (Pupion and Pupion, 1998, p. 109) or as an explanatory analysis of an ordinal variable (Fenneteau and Bialés, 1993, p. 28).
- U Mann - Whitney (for two independent samples) is applied when the study comprises ordinal variables over one variable that comes from two independent samples and verification of hypothesis concerning the existence of a difference between the two groups is required (Lambin, 1990, p. 250). In the literature it is known as two-dimensional analysis of a nominal ordinal variables couple (Fenneteau and Bialés, 1993, p. 47).
- Kruskal -Wallis (for k independent samples) is used in order to test, under certain circumstances, the hypothesis according to which the distribution of a characteristic is the same on k sub-populations (Pupion and Pupion, 1998, p. 83).

3. RESULTS

3.1. Non-parametric correlations

Following the application of *Spearman and Kendall non-parametric correlations* for the 14 pillars of the competitiveness index for the 42 European countries, have resulted the data shown in Table 1.

Table 1. Results for non-parametric correlations Spearman and Kendall

		policy_rules_1	environ_sustain_2	safe_secur_3	health_hyg_4	priorit_TT_5	airtransp_6	ground_tranp_7	tourism_infra_8	ICT_infra_9	price_compet_10	human_res_11	affinity_TT_12	natural_res_13	cultural_res_14
policy_rules_1	S	1	.589	.517	.062	.185	.389	.391	.113	.475	-.266	.589	.115	.247	.292
	K		.789	.699	.097	.279	.543	.542	.169	.663	-.392	.798	.159	.350	.426
environ_sustain_2	S		1	.603	.273	.220	.512	.631	.236	.677	-.310	.624	-.017	.380	.438
	K			.796	.387	.310	.692	.811	.376	.876	-.504	.829	-.014	.525	.601
safe_secur_3	S			1	.182	.333	.449	.447	.285	.600	-.331	.631	.217	.192	.287
	K				.256	.480	.645	.662	.404	.811	-.476	.830	.328	.251	.419
health_hyg_4	S				1	.134	.236	.331	.227	.289	-.108	.208	-.057	.154	.148
	K					.178	.328	.478	.339	.440	-.163	.313	-.092	.243	.238
priorit_TT_5	S					1	.424	.278	.469	.292	-.161	.368	.452	.152	.247
	K						.580	.397	.631	.436	-.252	.521	.625	.191	.342
airtransp_6	S						1	.552	.395	.593	-.449	.540	.066	.454	.554
	K							.735	.575	.802	-.654	.736	.112	.598	.768
ground_tranp_7	S							1	.327	.652	-.396	.561	.078	.322	.473
	K								.480	.844	-.564	.745	.093	.457	.665
tourism_infra_8	S								1	.411	-.164	.285	.229	.343	.327
	K									.578	-.239	.384	.356	.485	.460
ICT_infra_9	S									1	-.340	.631	.110	.368	.436
	K										-.497	.826	.145	.524	.599
price_compet_10	S										1	-.384	.071	-.150	-.412
	K											-.546	.091	-.257	-.619
human_res_11	S											1	.108	.240	.359
	K												.164	.345	.519
affinity_TT_12	S												1	-.089	-.055
	K													-.139	-.088
natural_res_13	S													1	.440
	K														.603
cultural_res_14	S														1
	K														

Source: own calculations with SPSS.20, (Note: S = Spearman coefficient, K = Kendal' coefficient)

Therefore, it is noticed that there are pillars that show particularities, either concerning inverse correlation with the other pillars, as the case of *price competitiveness* for which, the most intense negative correlation is the *air transport* and *ground transport* pillar, or show low correlations with all the other pillars, as the case of *health and hygiene* pillar.

It is important to mention that, pillars having the most intense positive correlations with most pillars that build-up the ratio are *air transport* and *ICT infrastructure*. A medium intensity correlation between *human resources* and *price competitiveness* pillars *human resources* and *cultural resources* pillars is also noticed.

3.2. Non-parametric statistics test

In order to apply the non-parametric tests Kolmogorov – Smirnov (for 2 independent samples), U Mann – Whitney test (for 2 independent samples) and Kruskal - Wallis test (for k independent

samples), we have divided the 42 European states as follows, amount of built-up sub-samples being:

- For EU member countries, $n_1= 27$ countries, non-member countries $n_2= 15$ countries;
- For former communist countries $n_1= 20$ countries, democratic countries $n_2= 22$ countries;
- For Eastern European countries $n_1= 5$ countries, Central European countries $n_2 = 18$ countries and Western European countries $n_3= 19$ countries;
- For developed countries $n_1= 20$ countries, developing countries $n_2= 22$ countries.

Table 2 shows only statistically significant results for these non-parametric tests used to test if there are statistically significant differences among ranks of countries.

Table 2. Results of non-parametric tests Kolmogorov – Smirnov, U Mann – Whitney and Kruskal – Wallis

	T&T regulatory framework				T&T business environment and infrastructure				T&T human, cultural, and natural resources				
	EU/nonEU	Ex-communist/ democracy	Eastern/central/ western european	Developed/ developing	EU/nonEU	Ex-communist/ democracy	Eastern/central/ western european	Developed/ developing	EU/nonEU	Ex-communist/ democracy	Eastern/central/ western european	Developed/ developing	
1. Mann – Whitney test - results													
Mann-Whitney U	97.0	49.0		21.0	83.0	35.0		9.0	98.0	35.0		32.0	
Wilcoxon W	475.0	302.0		231.0	461.0	288.0		219.0	476.0	288.0		242.0	
Z	-	-4.307		-5.012	-	-4.659		-5.314	-	-4.659		-4.735	
Asymp. Sig. (2-tailed)	.006	.000		.000	.002	.000		.000	.006	.000		.000	
2. Kolmogorov-Smirnov test – results													
Most	Absolute	.563	.768		.855	.622	.814		.909	.467	.714		.723
Extreme	Positive	.563	.768		.000	.622	.814		.000	.467	.714		.000
Differences	Negative	-.133	.000		-.855	-.096	.000		-.909	-.067	.000		-.723
Kolmogorov-Smirnov Z		1.748	2.486		2.766	1.932	2.633		2.942	1.449	2.310		2.339
Asymp. Sig. (2-tailed)		.004	.000		.000	.001	.000		.000	.030	.000		.000
3. Kruskal- Wallis test - results													
Chi-Square			26.164				27.406				25.266		
df			2				2				2		
Asymp. Sig.			.000				.000				.000		

Source: own calculations with SPSS.20

(Note: To separate out EU member or non-member countries, theoretical value is 125, to separate out former communist countries and democratic countries, theoretical value is 141, and to separate out developing countries and developed countries, theoretical value is 141)

Comparing the calculated results of the *U Mann – Whitney* test (table 2, point 1) with the theoretical ones in the tables containing the critical values of this test, it is noticed that – no matter the dividing characteristic of the sample concerning the 42 European countries, the calculated values are lower than the theoretical ones (for a statistical significance level $\alpha < 0.05$). As a result, the null hypothesis is accepted and hence *there are statistically significant differences between the groups considered as related to their ranks in ranking European countries* according to competitiveness index in tourism. It is also noticed that there are differences at the level of each of the three sub-indices that build-up the competitiveness index.

The results of the *Kolmogorov – Smirnov* test (table 2, point 2) emphasizes calculated values of the test that are higher than theoretical values (0.210 for a sample volume of 42), statistically significant, and hence the null hypothesis is rejected.

According to null hypothesis *the maximum difference between relative frequencies cumulated for the 42 European countries grouped according to various criteria is zero*, thus resulting that *there are differences between the ranks of European countries comprised in ranking and grouped based on these socio-economic and political characteristics.*

When grouping the 42 European states in Eastern, Central or Western European countries, following the application of the *Kruskal – Wallis* test, for two freedom degrees and a statistical significance level $\alpha < 0.001$, the theoretical value is 13.82, the calculated values being higher than theoretical ones, and as a result, in case of grouping the 42 countries based on this feature, there are differences between the ranks of the 42 European countries

4. CONCLUSIONS AND DISCUSSIONS

This paper fills out the previous results published by the authors (Gabor, Oltean & Conțiu, 2012) and, by means of non-parametric statistical methods it details and points out other aspects as well related to measuring and ranking of tourism competitiveness in European countries.

The ranks of each of the 42 European countries are influenced by many factors (economic, political, legislative, social etc.), each of the 42 countries promotes (or it should promote, in some cases) natural-cultural- anthropic potential in order to create from the tourist sector a competitive advantage on the world market.

In some countries, direct or/ and indirect activities – in tourism have an important contribution to GNP. Quite a few countries are promoting new forms of tourism, for instance: dark tourism (Gabor & Oltean, 2014), nautical tourism, silver tourism, war & battlefield tourism, babymoon etc. either to counteract the main causes of tourism seasonality or to attract market niche (Gabor & Oltean, 2015).

Using the non-parametric statistical methods has emphasized aspects that are not noticeable directly from ranking carried-out by the World Economic Forum based on *The Travel & Tourism Competitiveness Index*.

Thus, according to the World Economic Forum Top 10 includes the following countries: Spain tops the 2015 edition of the TTCI global rankings for the first time, followed by France (2nd), Germany (3rd), the United States (4th), the United Kingdom (5th), Switzerland (6th), Australia (7th), Italy (8th), Japan (9th) and Canada (10th) (World Economic Forum – 2015 Report, p. VII), six of the ten being European countries, except Switzerland, all being EU Members as well. From the previous research (Gabor & Oltean, 2012) by applying other statistical methods (PCA and cluster analysis) has resulted cluster 1 that included France, Germany and United Kingdom, i.e. countries defined by the following pillars: human resources, safe & security, environmental sustainable, policy rules, ITC infrastructure, air transport and price competitiveness, namely principal component PC1. Italy and Spain are countries that are successfully practicing sunlust tourism and this cluster (whose structure comprises Bulgaria and Greece according to Gabor & Conțiu, 2012) and that are characterized by the pillars grouped in principal component PC2, cultural and natural resources, respectively.

Completing the previous results, this research points out that, of the 14 pillars of T&TCI the strongest direct correlation is between *air transport* and *ICT infrastructure*, i.e. those pillars that led to the fact that, the Top 10 countries are clearly differentiated by the other groups. We have also emphasized that human resources is another important pillar that differentiates the ranks of the 42 countries, being medium correlated with *price competitiveness* and *cultural resources*.

Non-parametric statistical tests applied in this paper have pointed out that, if the 42 European countries are grouped based on various criteria (*EU member/non-member, ex-communist /democracy, Eastern/Central/Western European countries, developed/developing countries*):

- *There are statistically significant differences between the groups considered related to their ranks in ranking European countries, according to the results of the U Mann – Whitney test;*
- *There are differences between the ranks of European countries comprised in ranking, according to the results of the Kolmogorov – Smirnov test;*
- *In case of grouping the 42 European states in Eastern, Central or Western European countries, following the application of the Kruskal – Wallis test, it resulted that there are differences between the ranks of the 42 European countries.*

The results of this research will be the base of applying some other statistical methods, for instance, analysis of discriminating order to study thoroughly and better the differences or similarities between the 42 European countries.

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